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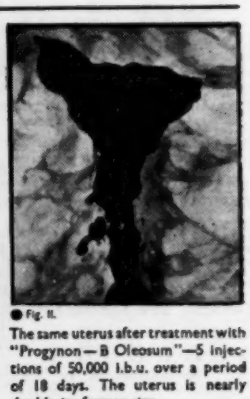

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Treatment of Acute Rheumatism in Childhood. By R. LIGHTWOOD, F.R.C.P.—(*With charts*) 613
Nitrous Oxide Analgesia in Obstetrics: Machine for Self-administration of Gas. By CHASSAR MOIR, M.D.—(*Illus.*) 615
Turmeric (Curcumin) in Biliary Diseases. By A. OPPENHEIMER, M.D. ... 619
Anti-curare Action of Substance 36. By Lady BRISCOE, M.B.—(*Illus.*) 621
Sporadic Salmonella Infections. By J. H. FISHER, M.R.C.P. 623
Hernio-appendicectomy. By J. T. MORRISON, F.R.C.S. 625
Sulphæmoglobinæmia Following Sulphanilamide Treatment. By G. DISCOMBE, B.Sc. 626

CLINICAL AND LABORATORY NOTES

Coma as the First Symptom of Diabetes. By E. F. SKINNER, F.R.C.P. — (*With chart*) 627
Eclamptic Hemiplegia. By M. HAJKIS, M.B. 628

MEDICAL SOCIETIES

Royal Society of Medicine: Sections of Surgery and Radiology: Irradiation in Malignant Disease ... 629
Section of Orthopædics: Ununited Fractures 631
Medical Society of London: Effects of Prolonged Dorsal Decubitus 633
West London Medico-Chirurgical Society: Diseases of the Colon .. 635
Edinburgh Obstetrical Society: Treatment of Placenta Prævia 636

REVIEWS AND NOTICES OF BOOKS

Clinical Heart Disease. By S. A. Levine, M.D. 637
Atlas of Radiographs. By A. P. Bertwistle, F.R.C.S. 637
Roentgen Interpretation. By G. W. Holmes, M.D., and Prof. H. E. Ruggles, M.D. 637
Dental Surgery and Pathology. By T. W. Widdowson, L.D.S., and E. V. B. Widdowson, L.D.S. 637
Chronic Diseases of the Respiratory Tract. By E. H. Funk, M.D. Revised by Dr. B. Gordon 638
A Preface to Nervous Disease. By Prof. S. Cobb, M.D. 638
Introduction à la chirurgie genito-urinaire. By Prof. E. E. Lauwers 638
Year Book of General Surgery, 1936. Edited by Prof. E. A. Graham, M.D. 638

LEADING ARTICLES

THE NEED OF A MEDICO-LEGAL INSTITUTE 639
ACUTE INTESTINAL OBSTRUCTION 639
AMŒBIC DYSENTERY IN CHICAGO 640

ANNOTATIONS

The Turn of the Tide—(*With chart*) 641
Susceptibility to Respiratory Infection 641
Schistosomiasis or Banti's Syndrome? 642
The Tilt Test 642
A Community Tuberculosis Survey 643
Cerebral Abscess 643
Venereal Diseases and Marriage 643
The Factories Bill and Medical Practice 644
Hermann Kümmell 644
Obstetrics and the Premature Baby 645
Cancer in Canada 645

PRINCIPLES OF MEDICAL STATISTICS

XI—Life Tables and Survival after Treatment .. 646

THE SERVICES

Royal Naval Medical Service—Army Medical Services—Royal Army Medical Corps—Royal Air Force 663

SPECIAL ARTICLES

Some Practical Aspects of Medicine in U.S.S.R. By R. H. DOBBS, M.R.C.P., and AUDREY E. RUSSELL, M.B. 648
International Biological Standards 652
Paris: The Crisis in Silk Sutures 654
Scotland: Bicentenary of the Royal Medical Society 654
Medical Members of the L.C.C. 670

GRAINS AND SCRUPLES

From a Rusticating Pathologist (III) 656

CORRESPONDENCE

The Dangers of Overstatement (Mr. T. B. Layton, F.R.C.S.) 658
Manipulative Surgery (Sir Herbert Barker) 659
Chest Leads in Electrocardiography (Dr. Ian G. W. Hill) 659
The Consolidated World Research Society Ltd. (Mr. C. M. Fegen) 660
Finger-prints (Dr. D. Jennings) 660
Radiogram and Radiograph (Dr. R. B. Myles) 661
p-Aminobenzenesulphonamide in Bacterial Meningitis (Mr. H. Preom and Dr. G. A. H. Buttle) 661
Royal Medical Benevolent Fund (Sir D'Arcy Power, F.R.C.S., and Dr. L. G. Glover) 661
Protamine Insulin (Dr. T. Izod Bennett) 662
A Review of Gold Therapy (Dr. H. S. Pemberton) .. 662
Analgesia in Labour 662
Hormone Treatment of Undescended Testis (Drs. A. W. Spence and E. F. Scowen) 663
A Spanish Ambulance (Lady Young) 663

PUBLIC HEALTH

Another Circular on the Public Health Act—Facing the Diphtheria Problem 664
Infectious Disease in England and Wales 655

OBITUARY

Charles Stanser Bowker, L.R.C.P. 665
William Denison Wiggins, M.R.C.S. 665
Robert Lachlan Pinkerton, M.D. 665
Joseph Clough, M.R.C.S. .. 666
Frederic Wilson Stansfield, M.D. 666
Richard Cresswell, M.R.C.S. 666
Charles Wilfred Coghlan, L.R.C.P. 666

PARLIAMENT

Criticism of Prison Conditions 666
Notes on Current Topics: The Factories Bill in Committee 667
Question Time: Government and Air-raid Precautions — Compulsory Pasteurisation of Milk—Workers' Hours—Mental Hygiene Out-patient Clinics in Scotland 669

MEDICAL NEWS

University of Cambridge .. 671
University of London 671
Besredka Prize 671
Department of Health for Scotland 671
Physical Training in Scotland 671
Margaret-street Hospital for Diseases of the Chest, London 671
Medical Society of London 671
Royal Medical Benevolent Fund 672
Royal Veterinary College, London 672
Royal Free Hospital 645
Coronation Tours 645

NOTES, COMMENTS, AND ABSTRACTS

Influence of School Routine on the Growth and Health of Children. By JOHN ALLAN. — (*With charts*) 674
Science and Building 675
Duration of Life in Fossil Man 675
Hæmopoiesis and the Pituitary Gland 636

Appointments 672
Births, Marriages, Deaths 672
Medical Diary 673
Vacancies 676

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BY REGINALD LIGHTWOOD, M.D., F.R.C.P. Lond.

ASSISTANT PHYSICIAN FOR DISEASES OF CHILDREN AT THE WESTMINSTER HOSPITAL; AND PHYSICIAN TO OUT-PATIENTS AT THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET, LONDON

EXCEPT for the passing fads and phases familiar in all diseases whose treatment is difficult, the therapeutics of acute rheumatism cannot be said to have undergone, for many years, any fundamental changes. True it is that there is less enthusiasm for the salicylate compounds than was the case at the beginning of the century, yet these drugs are still employed; and it is also a fact that nowadays we insist upon long periods of complete rest in rheumatic fever, chorea, and carditis, yet the importance of rest has been known for many decades. Perhaps the main changes in our attitude lie in an altered emphasis placed upon the various therapeutic measures, a growing awareness of public health to the importance of juvenile rheumatism as a national problem, and the organisation of large-scale treatment at considerable outlay by public bodies. Apart from further developments along these lines, can we expect any great changes or big advances while knowledge of the ætiology of acute rheumatism remains in a state of flux?

Ætiology

Thirty years ago the streptococcal causation of rheumatism was advanced, and in the succeeding years the principal claims put forward by Poynton and Paine have been gradually consolidated, not without modification, but even to-day not all would care to say that streptococcal infection is the basic cause of rheumatic fever. Fewer observers are convinced that any particular type of streptococcus is to blame, and fewer still can attempt to explain the mechanism by which a streptococcal infection may be followed in one person by recovery, in another by rheumatism, in a third by chorea, and in a fourth by the apparently unrelated condition of hæmorrhagic nephritis.

Of recent years there has been an increasing agreement that there are three phases in an attack of acute rheumatism. The first consists in the manifestations of a more or less acute throat infection, the second phase is a latent period of apparent recovery, while the third comprises one or more of the following: arthritis, chorea, carditis, nodules and rheumatic erythema. The symptom-free interval of the second phase was recognised by Haig-Brown (1886) half a century ago, but his important observation remained in temporary eclipse until Schlesinger (1930) and other workers began to draw attention to it. As Schlesinger, Sheldon (1931), and Coburn (1936) have been pointing out, an understanding of the changes taking place during the "silent" interval would certainly teach us much of the mechanism which determines the occurrence and severity of the rheumatic attack. In this direction the work of Coburn is particularly stimulating for he has begun to analyse the way in which the immunological changes which follow a streptococcal infection vary in different individuals and to ascertain what special differences are to be noted in rheumatic subjects. From his work it emerges that rheumatic children handle a streptococcal throat infection in a manner different from other persons, and there is hope that the time may come when we may be enabled to make a rational attempt to correct the abnormal reaction of the rheumatic subject to the streptococcal infection.

Without doubt, the streptococcal hypothesis is the favourite, but once again a rival has entered the field. Amies and Signy have looked for and found elementary bodies in pericardial exudates obtained from patients suffering with acute rheumatism; they have attempted, in collaboration with Schlesinger (1935), to show their specificity by agglutination reactions in the serum of rheumatic subjects. If and when this work is confirmed, the hypothesis of acute rheumatism as a virus disease (Schlesinger, Signy, and Payne 1935) will require careful and critical investigation.

Treatment

PREVENTION

Under these circumstances we cannot expect radical changes in treatment until a further lead is given by bacteriology. Yet there are certain relatively new observations to encourage us that further progress can be made by the clinician and by the public authorities without waiting for bacterial confirmation of the ætiological hypotheses. Now that it has been shown beyond reasonable doubt that the usual sequence of events consists of the three phases —namely, throat infection, latent period, and rheumatic attack—we are in a better position to be on the look-out for danger signals and to anticipate the onset of rheumatic disease. It is up to the clinician to make practical use of this knowledge. It is probably correct to infer that without tonsillitis or pharyngitis there would be little, if any, rheumatism. Thus, our first problem is to prevent throat infections in rheumatic children, and to this end we ought, I believe, to increase our vigilance in the early recognition of tonsillitis in children's hospitals, and in convalescent homes where rheumatic patients are undergoing treatment. Curiously enough, the most severe attacks of rheumatism are generally preceded by relatively mild tonsillitis, so that the transient character of the sore-throat and the small rise in temperature not infrequently cause it to be overlooked and to pass untreated. Sufficient isolation rooms ought to be provided so that every case of tonsillitis among rheumatic children can be separated and, in rheumatic units, the beds ought to be well spaced, rather on the lines adopted in isolation hospitals. Without these measures we cannot expect to prevent the occurrence of epidemic sore-throat.

THROAT INFECTIONS

The next point concerns the treatment of tonsillitis and pharyngitis especially as an intercurrent infection during convalescence from rheumatism. Though I have no experimental or pathological evidence for it, I believe that the moment when we can do most for the rheumatic child is the time when he develops his acute throat infection. It is, I find, particularly in hospital practice that thorough treatment of acute tonsillitis is not always carried out. For this purpose gargles are probably valueless, and I place chief reliance on painting the tonsils with a solution of protargol and in giving potassium chlorate by the mouth: rest in bed is essential and activity should

* Contribution to a discussion at the Harveian Society, on Dec. 11th, 1936.

not be resumed until the pulse-rate and sedimentation-rate are once again normal.

A series of battles have been waged, without very conclusive results, concerning the question of tonsillectomy. Statistics have been used to lend force to the arguments on each side. To the unbiased onlooker it would seem fairly certain from the figures that tonsillectomy does not protect against rheumatism; nor indeed would a reasonable clinician expect it to do so, for pharyngitis can lead to rheumatism almost as easily as tonsillitis. Nevertheless, clinical experience suggests to me that a complete tonsillectomy lessens the number of throat infections and may, therefore, be expected to be a help in suitably picked cases. Certainly we ought not to advise the removal of normal tonsils from any child, even a rheumatic one. The position now adopted by the experienced clinician can be summed up as follows: in a rheumatic child the question of tonsillectomy should depend upon the ordinary criteria which we apply to any other child; if the tonsils are irrevocably infected they should come out; the tonsillar glands and a history of sore-throats are our best guides.

Modern Methods

REGIMEN

Let us now ask ourselves what are the main points in modern treatment of acute rheumatism and rheumatic carditis, and how do recent observations help us? In hospital units organised for the work of treating rheumatic children, arrangements are made that every patient showing any evidence of rheumatic "activity" is nursed almost flat with but one pillow, is allowed no active movement except of the hands, and is fed by a nurse so that the work of the heart is reduced to a minimum. Together with this régime of complete rest some clinicians choose to employ drugs, but of those at present available none is of primary importance. When all signs of rheumatic "activity" have passed, a gradual return to ordinary life is permitted. For convenience and to guide the nursing staff, a routine schedule may be drawn up.

GRADE 1.—Patient nursed lying down, one pillow, fed by nurse.

GRADE 2.—Two pillows, semi-recumbent, allowed to feed himself.

GRADE 3.—Sitting in bed.

GRADE 4.—Dressed and allowed on a couch, later walking a few steps.

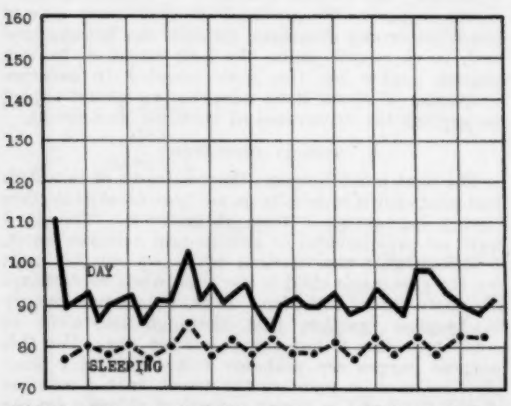

FIG. 1.—The normal relation of sleeping and day pulse-rates in a child.

GRADE 5.—Up half the day.

GRADE 6.—Up all day.

A similar régime can be employed in a private house provided suitable nursing is available.

The definition of rheumatic "activity" is not an easy one, and in some patients it is more difficult than in others. Too many doctors make the mistake of relying on the temperature, whereas in fact, the clinical thermometer is not a great help when once the beginning of the acute attack is past, and fever cannot be described as at all constant during the course of rheumatic carditis. On the other hand, of real value are careful charting of the pulse-rate and weekly estimation of the sedimentation-rate (Landau 1933, Payne and Schlesinger 1935). Until the sleeping pulse-rate is slow, and the normal relation between it and the day pulse-rate is resumed, and until the sedimentation-rate is normal on more than one occasion, we ought not to allow the rheumatic subject to be promoted from Grade 1 to Grade 2 (Figs. 1, 2, and 3). In patients with uncomplicated rheumatism this promotion can often be allowed after two or three weeks in the slighter cases, and after three

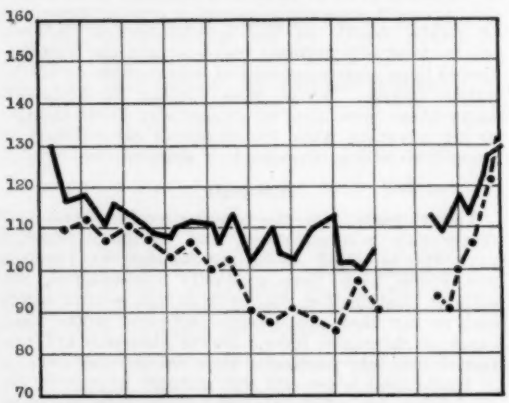

FIG. 2.—Sleeping and day pulse-rates in a case of rheumatic carditis, showing clinical improvement and then, after an interval, a relapse (on extreme right).

to five weeks in ones of moderate severity. But when we are dealing with carditis, two or three months is commonly necessary and sometimes many months of complete rest are required. When once the stage of "activity" is passed and our patient has been promoted to Grade 2, subsequent promotions are allowed at fairly short intervals, but each patient must be treated individually.

If an intercurrent attack of tonsillitis or pharyngitis supervenes, an exacerbation of rheumatism or of carditis must be feared and a return to Grade 1 is indicated. The use of aspirin to be given during the "silent" period has been suggested as a prophylactic measure, this suggestion being based on the analogy of its effects when used in large doses in animals subject to risks of anaphylaxis. It has not yet been proved clinically to be of definite prophylactic value in the silent period.

DRUGS

Many drugs have been used with the object of checking the rheumatic infection and limiting its damage. None has emerged triumphant. The latest addition to our therapeutic armamentarium is calcium aspirin. It is difficult as yet to be convinced that the length of treatment can be reduced by

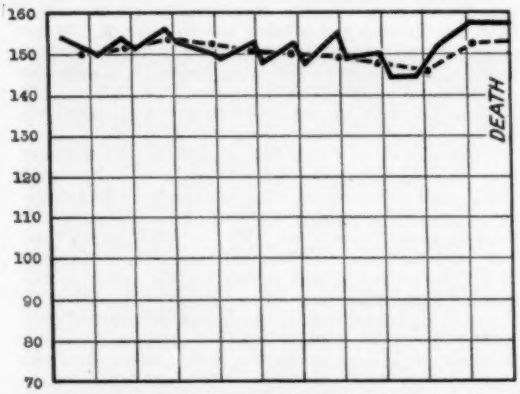

FIG. 3.—A fatal case of severe pancarditis, showing no interval between the rapid pulse-rates.

using this or any drug. The salicylate compounds and aspirin itself are chiefly of value in alleviating the pain experienced at the onset of acute rheumatism.

Conclusion

When the present position has been explored it has to be admitted that we have a very long way to go before we can afford to be complacent in regard to our great problem of treating rheumatism in children. The picture presented by a child who has a slowly progressive rheumatic carditis is one of the most discouraging that the physician has to face. If we are honest we must admit to ourselves that, like a fireman with too short a hose, we cannot extinguish a smouldering fire, licking the edge of the valuables in a locked house, whose exterior shows curiously little signs of the damage and danger within, for we can do little more than hope that the fire will burn itself out.

REFERENCES

Coburn, A. F. (1936) *Lancet*, **2**, 1025.
Haig-Brown, C. (1886) Tonsillitis in Adolescents, London.
Landau, A. (1933) *Amer. J. Dis. Child.* **45**, 691.
Payne, W. W., and Schlesinger, B. (1935) *Arch. Dis. Child.* **10**, 403.
Schlesinger, B. E. (1930) *Ibid*, **5**, 411.
— Signy, A. G., and Payne, W. W. (1935) *Lancet*, **1**, 1090.
— — and Amies, C. R. (1935) *Ibid*, **1**, 1145.
Sheldon, W. (1931) *Ibid*, **1**, 1337.

NITROUS OXIDE ANALGESIA IN OBSTETRICS

A NEW TYPE OF MACHINE FOR SELF-ADMINISTRATION OF GAS

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DURING recent years much attention has been given to the use of nitrous oxide gas as a means of lessening the severity of the pains of labour. With the introduction of automatic apparatus a patient is now able to administer to herself a mixture of gas and air and thus produce a temporary analgesia with each recurrence of a uterine contraction. There are two outstanding advantages in this method of treatment: nitrous oxide correctly diluted with air or oxygen is without danger to mother or fœtus, and its use does not lessen the frequency or strength of the uterine contractions. On the other hand, this type of analgesia falls short of the ideal for the reason that the relief of pain conferred by the intermittent inhalations is often imperfect, and not infrequently so inadequate that the patient has no wish to continue with the treatment.

It is the object of this paper to discuss the reasons for unsatisfactory analgesia and to suggest methods by which the results may be improved.

INDIVIDUAL VARIATIONS IN RESPONSE TO NITROUS OXIDE

Before dealing with methods of inducing analgesia with nitrous oxide, it may be well to point out that individual patients vary greatly in their response to small doses of the gas. This variation is very evident when the gas is used to produce anæsthesia for dental extractions. It is not uncommon to find that one patient after inhalation of a small quantity of nitrous oxide will show a deep and comparatively long sustained anæsthesia, while another patient after inhalation of a far greater quantity of gas will still be imperfectly anæsthetised and will recover consciousness in a very short space of time.

Similar variations of response to nitrous oxide are only to be expected when intermittent inhalations of the gas are given during labour; and unfortunately a small proportion of women are so resistant to its influence that it is well-nigh impossible for them to obtain a satisfactory analgesia by its use. This fact restricts the usefulness of all nitrous oxide machines of the automatic type. In order to be safe, such machines must necessarily limit the quantity of gas supplied to the patient, and not infrequently the restricted amount of nitrous oxide is insufficient to produce an appreciable relief of pain. Should a patient be found to belong to this refractory class, it is both useless and unkind to continue with this form of analgesia: a more concentrated nitrous oxide-oxygen mixture should be given by an anæsthetist, or, alternatively, other analgesic agents should be employed.

MACHINES INTENDED FOR SELF-ADMINISTRATION OF GAS

The credit for developing a practical form of automatic nitrous oxide machine for the self-induction of analgesia goes to Minnitt (1934), who introduced the apparatus now known by his name. This machine is adjusted to deliver a fixed concentration of nitrous oxide gas. By experiment it was found that 35 per cent. of gas diluted with air is usually capable of inducing analgesia while at the same time avoiding a dangerous cyanosis. This machine and others of similar type are now widely used in midwifery practice in this country, and have been favourably reported on by various workers, and notably by the committee appointed by the British College of Obstetricians and Gynæcologists to investigate the use of analgesic agents in midwifery.

This type of apparatus does not, however, give uniformly successful results, and many obstetricians have been disappointed by the meagre benefits which it confers. It has been my experience that while a few patients experience an analgesic effect and are grateful for the relief obtained, many others find that the severity of the pains is unaltered. Similar results have been obtained with different machines, thus excluding the possibility that the lack of effect was due to defective apparatus.

A COMMON CAUSE OF INEFFICIENT ANALGESIA

Observation of patients in labour has convinced me that a common cause of inefficient analgesia is the inability of many women to inhale an adequate amount of nitrous oxide before the full force of a uterine contraction is upon them. To keep a mask firmly applied to the face during rest-intervals

requires a determination which few patients possess; and there are other reasons—of which expense is one—which make it undesirable for the patient to be kept continuously under the influence of the gas throughout her labour. In practice, therefore, inhalation of nitrous oxide is always intermittent, and a patient cannot be expected to use the gas machine until there is a warning sensation of a renewed uterine contraction. From that moment only 10 or 15 seconds are available in which the gas may be inhaled before the pain becomes distressingly severe. Further inhalations demand great self-control, and are indeed almost impossible during the second stage of labour for the reason that the patient now has an irresistible urge to "bear down." For the great majority of patients the degree of analgesia is, therefore, determined by the amount of gas which can be inhaled during the short period of 15 seconds which precedes the climax of each pain.

EXPERIMENTAL OBSERVATIONS

To gain information regarding the effect of such short administrations of nitrous oxide, experiments were performed in order to observe and to record the sensations experienced when the gas is inhaled in the manner adopted by the patient in labour. These observations were made by myself and by volunteers.

Measurement of the analgesic effect of nitrous oxide presents great difficulties and has not been attempted. It is, however, a simple matter to observe the characteristic "dizzy" or "light" sensation which is induced by the gas, and to use this as a measure of the efficiency of the various methods of administration. The time of onset and the time of maximum intensity of the induced sensation can both be accurately recorded, and although there is no precise "end-point" the duration of effect can also be observed. The intensity of effect cannot be measured by any yardstick, but it is quite possible to record in rough fashion one's impression of the relative strength of the sensations produced by various methods of administration.

Experiments with 35 per cent. gas-air mixture were made with the aid of a commercial form of machine designed to deliver this concentration of nitrous oxide; the experiments with pure gas were made with the machine which will be presently described. The results are shown graphically in Fig. 1.

The most obvious experimental finding concerns the intensity of the sensations induced by different concentrations of nitrous oxide gas. Pure gas, inhaled for only 12 seconds (two deep breaths) was found to produce a considerably greater effect than the diluted gas inhaled for 30 seconds. Moreover, if inhalation of the diluted gas was also restricted to 12 or 15 seconds—which represents the usual time available before the climax of a labour pain—its action was greatly reduced, and by comparison with pure gas was almost insignificant in effect.

Passing now to the speed of action, it was found that the diluted gas does not begin to take effect until nearly 30 seconds after the start of the inhalations, although forced deep breathing will reduce this time to about 25 seconds. On the other hand, pure gas was found to take effect in 16 seconds, thus giving it a type of action well-suited for the relief of the rapidly developing pain of a uterine contraction.

Further experiments showed that five or six deep and moderately rapid breaths of pure gas do not in a normal person produce cyanosis, while even two such breaths are, as will be shown, sufficient in most patients to produce an appreciable degree of analgesia.

The effect of nitrous oxide reaches a maximum about 20 seconds after removal of the mask. This increase of action is important when short administrations of gas are given for analgesic or for anæsthetic purposes.

AN IMPROVED INTERMITTENT METHOD OF ADMINISTRATION

Since the pains of labour are intermittent, and since there is but short warning of their approach, it is essential that nitrous oxide gas should be given in a manner that will secure as speedy an analgesia as possible. As has just been stated, this speed is best achieved by the use of pure gas.

Hitherto, machines designed for self-administration of nitrous oxide have depended for their safety on an automatic dilution of the gas with approximately 65 per cent. of air. If such machines were to be adapted for the delivery of pure gas it was clear that some new means of securing safety would have to be employed. It occurred to me that this problem could be easily solved by introducing a device which would prevent the patient from obtaining more than a limited quantity of the gas at one time. Thus, it would be a simple matter to provide a bag containing sufficient gas for two deep breaths only. After emptying, this reservoir could be very slowly replenished by gas issuing from a fine nozzle. When full the bag could be made to press on a cut-out lever, thus checking any further delivery of gas. It will be seen that the principle is exactly similar to that of the familiar water cistern: a fixed supply of water is held in the tank, the water can be withdrawn rapidly, but is slowly replaced, so that the tank is replenished only after the lapse of a considerable interval of time.

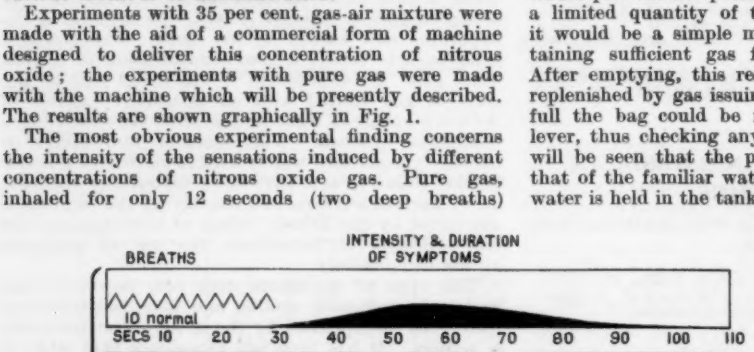

FIG. 1.—Comparison of the effects induced by nitrous oxide gas when inhaled in different manners.

The practical difficulties in constructing a machine to work on this principle have been very successfully overcome by Mr. Charles King, to whom I am much indebted for help.

The machine as now constructed by Messrs. A. Charles King Co., Ltd., London, W.1, uses as reservoir a rubber bag of $\frac{1}{8}$ gallon capacity connected on the one side to the nitrous oxide supply and on the other to a delivery-tube and face-piece. The filled bag automatically cuts

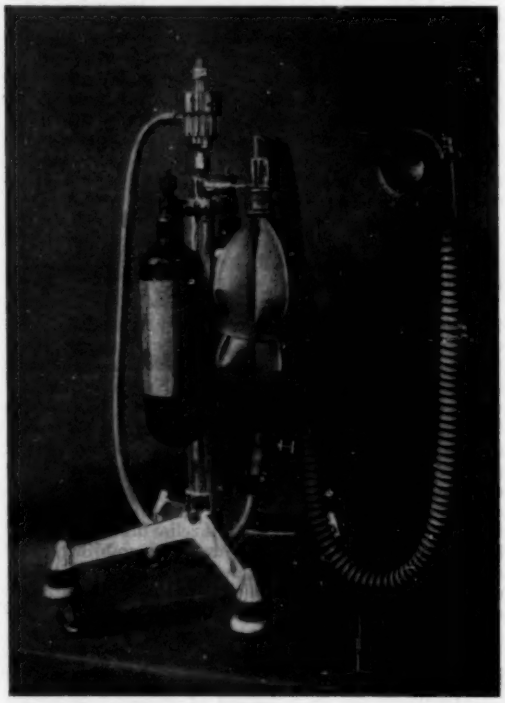

FIG. 2.—The new type of nitrous oxide machine.

off the gas supply by the usual method of forcing outwards two levers, which obstruct the inflow tube. Escape of gas through the exit tube is prevented by a weighted valve, which is, however, easily lifted by the slight suction of an inspiratory effort. This valve also acts as a non-return valve so preventing dilution of gas by exhaled air. The high-pressure gas from the cylinder is reduced by an Adams valve to 5 lb. per square inch. Between the reducing valve and the bag is placed a fine carburettor jet through which low-pressure gas flows at such a rate that a full minute is required for the reservoir to be replenished to capacity. The face-piece is an improved type which can be repeatedly sterilised by boiling. Mounted on it is a small valve which allows the escape of exhaled air (Fig. 2).

The machine is simple in construction; there are no adjustments to regulate; there is no pressure gauge; nor is there need for an "on-and-off" plunger on the face-piece—a complication which many patients find difficult to use. The machine is comparatively cheap and is economical in use. It has been found that a patient having pains at about 4-minute intervals will consume 50 gallons of gas, costing 3*s*., in 4 or 5 hours.

This new form of nitrous oxide machine can be used freely whenever labour pains become distressingly severe. The patient should be introduced to the machine at an early stage of her labour, and given the simple instructions for its use. With the first warning of a renewed pain she should instantly press the mask firmly to her face and proceed to empty the bag in two (or not more than three) deep, moderately quick, breaths. The mask is then laid aside in readiness for the next pain. The amount of gas used will never make the patient unconscious or prevent her from obeying the instructions of her medical attendant and nurse. It will, however, confer on the majority of patients a substantial degree of analgesia for about 60 seconds.

RESULTS

Great caution must be observed in judging the value of analgesic agents in midwifery. A treatment which does not abolish pain but merely lessens its intensity does not lend itself to measurement in terms of efficiency, and the difficulty is increased by the fact that a patient's description of pain is often an unreliable indication of its severity. Much also depends on how questions are put, and it is not uncommon for different observers to form contrary opinions regarding the usefulness of an analgesic agent in the same patient. Further, I believe that statistics based on statements made by patients on the day after delivery are almost worthless. At that time the patient is often in an elated state of mind. Her baby is born and her anxiety is over: in these circumstances she has a softened recollection of her troubles of the previous day, and tends to praise any treatment which may have been given. If she has had chloroform for the final stage of labour, the blunting and confusion of the memory may be very conspicuous, and there is often a curious amnesia for the events preceding the administration of the anæsthetic. For these various reasons I hold most strongly that the efficiency of an analgesic agent used during labour must be judged *while the patient is still in labour*. This important condition has not always been observed in reports dealing with the use of analgesic drugs in midwifery.

When judged by the foregoing standards the new form of nitrous oxide machine has given results which are surprisingly good. For each case a record was kept of the observed effect of the gas, and of the parturient patient's opinion of the value of the treatment. Of 100 patients, 70 stated that they got "good" or "very good" relief of pain from inhalation of the gas, while a further 14 women described the effect as being "fairly good." In some cases the benefit obtained was remarkable. Thus, it has happened on several occasions that a patient has declared that the gas prevented a "pain" from developing—meaning by this that she believed that the course of labour was being delayed. Yet observation has shown that the uterine contractions were in no way impaired, although the associated pain was abolished.

On the other hand, 16 patients stated that the gas gave no help or that it only "helped a little." For reasons previously stated, a certain number of refractory patients must be expected. This group includes patients who for one reason or another could not follow the simple instructions for using the apparatus. Some women have too little intelligence or self-control to inhale in the required manner, and others cannot be made to understand that the mask must be firmly pressed to the face. It is seldom that an intelligent and coöperative patient fails to get substantial relief from use of the new machine.

Apart from patients' statements, it is my own opinion, and the opinion of labour-ward nurses, that patients are, almost without exception, considerably quieter and less exhausted by labour pains while making use of the new form of gas machine.

Every patient likely to give a considered opinion was asked to compare a machine of the type delivering a gas-air mixture with the new form of machine. With two possible exceptions, every woman who obtained relief from the use of gas expressed a distinct

preference for the new type of apparatus. One of the exceptions was a woman who declared that she got equally good relief from either machine. The other was a patient who said that she preferred to use the gas-air machine. I did not myself see this patient during labour, but a later conversation with her left me with the impression that her testimony was of doubtful value.

In the series of patients just described, gas analgesia was used throughout the greater part of labour. Before the "pains" became fully established it was customary, however, to give one or two doses of tincture of opium together with chloral hydrate and potassium bromide. During the final stage of labour, when the vulva begins to distend, most women become too restless to attend to a face-mask and to force themselves to breathe in the correct manner. Generally speaking, therefore, the use of gas should not then be persisted in, and in the present series chloroform was usually administered, preferably by the Young Simpson inhaler. In several instances, however, a patient obtained so much relief from the gas machine that she refused to give it up, and was successfully delivered while still under the influence of the self-administered nitrous oxide.

There were no maternal deaths in this series. Five patients were delivered with forceps. Stillbirths numbered two: one of these was a fœtus showing advanced maceration (one of a twin pregnancy). The other was a stillbirth which resulted from a prolonged labour complicated by early rupture of the membranes; in this case, too, the umbilical cord was tightly twisted round the fœtal neck.

THE POSSIBILITY OF CYANOSIS

In the 100 cases described, a careful watch was kept for the possible occurrence of cyanosis. This condition was never seen in obvious form.* In four patients, however, it was thought that an intermittent slight cyanosis appeared, although in at least one of these cases there was difference of opinion regarding its presence. In considering this matter it is necessary to bear in mind that many patients show considerable congestion of the face during bearing-down efforts, and it is therefore not easy to decide whether a slight and transient duskiness is to be accepted as a token of anoxæmia due to the inhalation of pure nitrous oxide gas. In none of the four cases was any harmful effect observed; and I believe that serious anoxæmia need not be feared for the reason that the periods during which oxygen is withheld rarely endure for even 15 seconds. It would, however, be ordinary prudence to avoid even this reduction of oxygen intake in a woman suffering from cardiac failure or other form of respiratory distress: for such a patient some other form of analgesia is obviously indicated.

COMPARISON WITH OTHER FORMS OF ANALGESIA

In conclusion it may be fitting to compare the method of analgesia described in this paper with other methods which are in common use.

Scopolamine and morphine, Nembutal, Sodium Amytal, and other barbiturates, either by themselves or in combination with other narcotic drugs, all have the disadvantage of erratic action; and in large dosage they are unsafe. Rectal injection of ether and of paraldehyde, while reported to give excellent results by some workers, are methods which have not been generally favoured in this country, partly because of the difficulty of administration, and partly because of the variable effects produced. All these drugs have the additional disadvantage that the patient becomes stuporose (in some cases restless) and must be kept under constant observation. It is also generally agreed that the course of labour is delayed by their use. Nitrous oxide analgesia, on the other hand, has the great advantage that the patient's coöperation is maintained, and that her labour is not hindered.

For the patient who can afford to have an anæsthetist in attendance throughout labour, nitrous oxide and oxygen can be used with almost ideal results. Such a patient has the advantage that the concentration of gas can be varied to suit requirements; and even if she belongs to the "refractory type" the treatment can still be used with a fair degree of success. For the less fortunately placed patient the new type of automatic apparatus gives results which, although admittedly less perfect, are nevertheless surprisingly good. This new machine is undoubtedly more effective in relieving the pains of labour than the type which depends on dilution of gas for the ensuring of safety. It is simple and reliable, and has proved itself to be a very valuable addition to the equipment of a labour ward.

SUMMARY

1. There are important advantages in the use of nitrous oxide gas as a means of securing analgesia during labour.

2. Machines designed to deliver diluted nitrous oxide are often inefficient in relieving pain for the reason that it is difficult or impossible for many patients to inhale sufficient gas before the full force of a uterine contraction develops.

3. Pure nitrous oxide gas has a much more rapid and intense action than 35 per cent. gas-air mixture, and is therefore better suited for the needs of a patient in labour.

4. A new form of nitrous oxide machine is described which enables a patient to inhale pure gas at regular intervals, and so induce in herself an intermittent state of analgesia. Safety is secured by a device which makes it impossible for the patient to obtain more than two deep breaths of gas before the onset of each pain.

5. A series of 100 cases is recorded in which the new machine was used with success. In the great majority of cases a useful degree of analgesia was obtained.

Clinical experience with the new form of nitrous oxide machine has been obtained in Hammersmith Hospital (British Postgraduate Medical School), and I am indebted to the medical superintendent for providing facilities for its use. I gratefully acknowledge the help of labour-ward sisters in collecting case records. The results are published with permission of the medical officer of health of the London County Council.

REFERENCES

Ann. Rep. Brit. Coll. Gynæcologists and Obstetricians, 1935, p. 87.

Minnitt, R. J. (1934) *Lancet*, **1**, 519, 1278.

* In a later series of cases there was one patient who developed obvious cyanosis when she first attempted to inhale gas during a labour pain. Later administrations were accompanied by a cyanosis of lesser degree. Similar cyanosis followed use of a machine delivering a 35 per cent. gas-air mixture. This patient had the peculiar habit of almost completely inhibiting her respirations from the first warning of the onset of a labour pain, and without gas in any form a distinct duskiness appeared during each "pain." She was later delivered spontaneously of a healthy baby.

MOTHERS IN SKYE.—A new maternity annexe to the John Martin Hospital, Uig, in the Isle of Skye, has recently been opened.

TURMERIC (CURCUMIN) IN BILIARY DISEASES

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Turmeric, or *Temoe lavae*, is an oriental plant that for many centuries has been used by the native population of India in the treatment of jaundice. The powdered roots and leaves form one of the chief ingredients of "curry." The botanical name of the plant is Curcuma; there are a number of species, among which *Curcuma domestica* and *Curcuma longa* have medicinal value.

EFFECTS OF ADMINISTRATION

There are references to the therapeutic use of curcuma as early as 1748 (Loeber) and 1867 (Shortt). The interest of the medical profession and the pharmaceutical industry was reawakened in 1927, when Koch and Guttenberg reported successful treatment of hepatic and biliary diseases with a preparation containing extracts of curcuma. Similar observations have since been published by Kalk and Nissen (1931), Franquelo (1933), Fähndrich (1932), Henning and Künzel (1934), Potter van Loon (1934), von den Velden (1934), Helmy (1935), Vetterlein (1935), and Leclerc (1935). Some investigators used aqueous extracts of the whole root; others only the yellow pigment which it contains, called curcumin. Unlike Kalk and Nissen, who attributed the therapeutic effect to a number of components extracted from the root, Franquelo, and Henning and Künzel were not able to produce, in men and animals, any demonstrable action except by using an ethereal fractional extract containing curcumin. A solution of pure crystalline curcumin has been proved to cause identical pharmacological effects. For practical purposes, sodium curcumin is used, since it dissolves more readily in water. It is with this pigment that I have carried out a series of experiments which, begun in 1932, totalled 103 observations in July, 1936. The preparations used since 1934, Curcumen or Curcunat, contain respectively 0·25 gramme of sodium curcumin in 5·5 c.cm. of water for intravenous injection, and 0·1 g. sodium curcumin with 0·1 g. calcium cholate per dragée for oral administration.

Tracings from cholecystograms of a healthy man, aged 27, before and (right) after the intravenous injection of 5 per cent. sodium curcumin.

In healthy persons, intravenous injection of 10 c.cm. of a 5 per cent. sodium curcumin solution produces rapid emptying of the gall-bladder, clearly demonstrable on cholecystograms. The gall-bladder shadow is found to be considerably reduced in size 10–20 min. after injection. Generally speaking, this diminution is greater than that observed in the same persons after a fatty meal containing the yolks of three eggs. The tracings here reproduced are taken from the original Röntgen pictures. The effect is not constant: out of 34 examinations made for this purpose, the size of the gall-bladder shadow did not change at all after injection in 6 instances; there was only moderate decrease in size in 12 others; the pronounced effect described above was found in 16 persons. I have not been able to ascertain what conditions determine this variability. Negative evidence indicates the factors that are *not* involved. The variations are not due to inconstancy of the preparation, for the self same solution may empty the gall-bladder in one person yet fail to affect its size in another, even if used within the same hour; nor are age, sex, body-weight, and general habitus involved in this question.

After oral administration of the dye, hardly any changes are apparent in the aspect of normal gall-bladders. In this connexion it is of interest to note that curcumin is easily absorbed from the digestive tract, and that both in rabbits and in men the pigment is eliminated through the bile-ducts within 15 min. of intravenous injection (Henning and Künzel 1934). During this interval an "enormous increase of the outflow of bile," subsiding with complete elimination of the dye, has been reported by these authors. By means of a special test the dye was eventually found in the urine after both intravenous and oral administration; only faint traces were detected in the fæces. From these and our own observations one may conclude that curcumin passes through the liver, inducing increased secretion of bile and, frequently, emptying of the gall-bladder: in other words, its action is both choleiretic and cholagogue. It is finally eliminated through the kidneys.

Clinically, excellent results have been reported in the course of the curcumin treatment of biliary diseases, especially in Germany. In these publications, however, the use of additional measures is invariably mentioned—such as diets of various kinds, insulin, dextrose, magnesium sulphate, and sundry other variable factors involved in hospital treatment. In an investigation of this kind the therapeutic effect of any form of medication, however definite it may seem, is difficult to distinguish from that of the general treatment simultaneously adopted, especially in the case of a drug heretofore unknown. I have therefore restricted the administration of curcumin to those patients who did not urgently need hospital treatment. Bearing in mind the fact that a large group of biliary diseases would thus escape observation, I have used curcunat since 1933 in the treatment of 67 patients suffering from subacute, recurrent, or chronic cholecystitis. No other medication was given. In all cases, animal fat, cabbage, sardines preserved in oil, and mayonnaise dressings were forbidden, but no other restriction of diet was imposed, and no form of physiotherapy was used. In addition to thorough physical examination and the usual laboratory tests, Röntgen examinations were made regularly, except in the presence of severe jaundice. After a number of trials intravenous administration was abandoned, for it does not give better results than the more convenient oral method. The intravenous injection of curcumin should be reserved for those conditions that require immediate action; but in such emergencies I consider dextrose and insulin in the "toxic liver" and the advice of an experienced surgeon in an acute purulent infection are decidedly preferable to any other procedure. Accordingly, the patients here mentioned as treated with curcunat belong to the group of biliary diseases in which medical advice is sought because of persistent abdominal discomfort associated with slight recurrent jaundice.

TYPICAL CASES

Case 1.—A male teacher aged 37; married, with two healthy children. Except for typhoid fever 10 years ago

the previous history is negative. For the past 4 years sensation of fullness in the upper abdomen, beginning about an hour after meals; acid eructations occasionally; no definite relation of symptoms to the type of food; no vomiting; periods of much discomfort alternate with intervals of relief. For the last 2 years very severe unilateral headache (right side) has been associated with the abdominal symptoms. He said he had often observed yellow discoloration of the scleræ before and during periods of more pronounced discomfort. No colicky pain; stools not discoloured; urine not observed.

Physical examination.—Nov. 22nd, 1933: slight jaundice, more noticeable in the scleræ and on the soft palate. The whole upper abdomen was tender on palpation; liver not enlarged, but very tender on pressure; much hyperæsthesia of the skin along the right costal arch. Urine: much urobilin. Radiography: gastro-intestinal tract normal. Cholecystography with oral tetragnost: no gall-bladder shadow. After 5 days intravenous cholecystography: no gall-bladder shadow.

Treatment.—Animal fat, fried meat, and cabbage forbidden. Curcunat dragées, beginning with 3 daily for three days, then 6 for four days, then 8 for two weeks.

Progress.—Patient went to work as usual; no rest. After three days he states that he feels perfectly well. The sixth day the jaundice has disappeared. The twelfth day no more tenderness of the abdomen. Radiography (Feb. 4th, 1934): Cholecystography with oral tetragnost: gall-bladder shadow normal in size, position, density, shape, and reaction to fatty meal. Up to July, 1936, no more discomfort except on one occasion, when after a heavy meal he had a bad headache and moderate pain in the right epigastrium, radiating to the back. He took again 3 dragées daily of curcunat for a few days, after which he discontinued the medication, the symptoms having subsided immediately.

Summary.—Chronic cholecystitis with jaundice of 4 years' duration, and hemicrania of 2 years' duration. No filling of the gall-bladder on either oral or intravenous cholecystography. After treatment with curcunat and slight dietary restrictions, but no other therapy whatever, complete relief lasting two years at present. Normal filling of the gall-bladder shown by cholecystography 6 weeks after beginning of treatment.

CASE 2.—A married woman aged 25; no children. Previous history negative. For the past two years, off and on, distension in the upper abdomen and tendency to constipation; no vomiting; occasional stabbing pain in the right upper abdomen, radiating to the back. No jaundice observed. Previous diagnosis: colitis. No result from the dietary treatment used.

Physical examination.—Jan. 8th, 1935: healthy looking young woman. No jaundice. Liver moderately enlarged, a little harder than usual. Circumscribed tenderness in the region of the gall-bladder; no definite hyperæsthesia of the skin. Temperature 100·2° F. Jan. 10th: no gall-bladder shadow on oral cholecystography. Jan. 16th: no gall-bladder shadow on intravenous cholecystography.

Treatment.—Animal fat, cabbage, and fatty dressings forbidden. Curcunat 3 dragées daily for two days. On the second day much discomfort and stabbing pain in the right side. Gradual increase of the medication until, after 3 weeks, 8 dragées are taken daily.

Progress.—Symptoms subsided entirely by the end of the first week. About the middle of the third week pain in the right side associated with nausea and dizziness. Close questioning reveals that she had eaten sardines preserved in oil the night before the discomfort began; consequently all kinds of preserved foods were forbidden. Feb. 25th: no more symptoms; no tenderness of the abdomen; liver no longer enlarged. Oral cholecystography: gall-bladder shadow very dense, normal in size and in reaction to fatty meal. May 5th, 1935: has been in perfect health ever since.

Summary.—Chronic cholecystitis, subsiding rapidly after curcunat treatment. The cholecystographic gall-bladder shadow, absent before treatment, became normal 6 weeks after beginning of therapy. In July, 1936, she had been free of symptoms for 15 months.

CASE 3.—A merchant aged 54 years. Typhoid fever, amœbic dysentery, and possibly Weil's disease during the Great War. Since 1919 occasional diarrhœa. Since 1921 itregular periods of abdominal discomfort, with acid eructations, great distension, and sense of fatigue. He was told by his family that his eyes were occasionally yellow. Because of these symptoms the appendix was removed in 1926. After about two years of distinct relief the same symptoms reappeared. Treatment with magnesium sulphate, diathermy over the upper epigastrium, and strict diet gave only temporary improvement. Has gained weight since 1930; discomfort increased since. Recently an attack of colicky pain in the right upper abdomen. Operation therefore advised.

Physical examination.—April 16th, 1935: patient of the short, stout, fat type; looks rather pale; distinct jaundice of the scleræ. Much tenderness in the region of the liver, which was not distinctly palpable owing to muscular resistance; spleen very hard, moderately enlarged; descending colon cord-like. Urine: traces of bilirubin; much urobilin. Proctoscopy: nothing abnormal. Radiography: descending duodenum greatly displaced towards right, angulated, tender on pressure. String-shaped appearance of the transverse colon. No filling of the gall-bladder on oral cholecystography.

Treatment.—Animal fat, cabbage, fatty dressings, and all preserved foods forbidden. Curcunat dragées, beginning with 3 daily, gradually increasing to 6 daily.

Progress.—Very acute aggravation of the symptoms on the second day; since then rapid improvement. On discontinuing the medication, however, the patient again felt fullness and distension; he therefore got so used to the preparation that he has been taking it continuously for more than a year past. Except for occasional diarrhœa he had not complained of any discomfort up to July, 1936, 14 months after beginning treatment.

Summary.—Chronic cholecystitis with slight jaundice. Spastic colon as a residue of long-past intestinal infections. Symptoms subsided after curcumin treatment. Has taken curcunat regularly for 14 months without feeling any ill effects.

RESULTS OF TREATMENT

These are examples of the group of gall-bladder diseases that have been treated with curcunat. In every instance, but with slight variations, the history, physical findings, and röntgen findings were similar to those described above. All the patients were treated in the same way—namely, very slight dietary restrictions, oral administration of curcunat for three weeks in increasing doses, no other therapy, no rest. More or less definite aggravation of the symptoms was often observed during the second or third day of this treatment, but relief was almost invariably obtained after about a week. In many instances the symptoms recurred after several months; the patients have then been treated as before and with similar results. It was not possible to follow up all of the patients so treated; but a large number were under observation for 2 years or more. Of the 67 patients thus treated only one did not improve at all: this one was operated upon after a few weeks and a shrunken gall-bladder full of pus was removed. With this single exception all the patients were completely relieved throughout periods of observation lasting from 3 months to over 3 years. No ill effects were observed or reported, even when the medication was continued for many consecutive months.

In 18 cases cholecystograms were made before and after treatment; in all of them the gall-bladder shadow was found either absent or very faint before treatment but of normal density afterwards. Of course the absence of filling does not prove cholecystitis, nor does a normal shadow exclude it. But if a non-filling gall-bladder appears normal with subsiding clinical symptoms, this finding, however dubious it may be in itself, is an objective confirmation of the clinical observations. In this connexion it is of real interest to note that no filling

was obtained before treatment, after either oral or intravenous administration of the cholecystographic dye; whereas, after treatment, the gall-bladder filled normally on oral ingestion.

Since curcunat dragées contain not only curcumin but also calcium cholate, the result of the treatment might be ascribed to the latter; but the experiments mentioned at the beginning of this article, as well as the Röntgen observations on intravenous injection of solutions of pure sodium curcumin, prove conclusively that this pigment alone acts as a powerful cholagogue and choleiretic in man and in animals. Similar pharmacological effects have not been shown after giving calcium cholate in the doses used here. It seems quite possible, however, that the therapeutic effect of curcumin is increased by the addition of calcium cholate, for it is well known that cholates increase and accelerate the intestinal absorption of a number of drugs.

CONCLUSIONS

The demonstrable mechanism underlying the clinical results consists in the passage of curcumin through the liver, and in the considerably increased flow of bile that it produces. Emptying of the gall-bladder, a less constant factor, may increase the effect. These principles apply to almost all forms of therapy known to improve or cure biliary infections. Decongestion of the liver, mechanical elimination of infectious material by the increased flow of bile, and antiseptic qualities, have been considered responsible for the therapeutic effects observed. Curcumin clearly acts similarly; its effect, however, seems to me to be superior in chronic cholecystitis to most of the drugs used in this group of diseases. For reasons already mentioned I have not treated with curcumin such acute complications as hydrops of the gall-bladder, purulent cholecystitis and cholangitis, or ascending hepatitis. In a number of recent publications satisfactory results are reported from the intravenous injection of curcunat in these conditions, and since this has proved to be a perfectly innocuous drug, intravenous administration may be tried in such complications if the condition of the patient justifies the experiment. In general, however, the effect of a single mode of medication can hardly be ascertained in these cases, as the severity of the illness calls for numerous therapeutic measures, the results of which become superimposed and correlated.

For the appropriate oral treatment the following method may be recommended: First, second, and third days, 3 dragées daily, after meals. Fourth to seventh day, 5 dragées daily. Seventh to twenty-first day, 8 dragées daily. The medication can be increased and prolonged if necessary.

SUMMARY

Intravenous injection of curcumin, the pigment contained in turmeric, produces considerable increase of the flow of bile and—but not constantly—rapid emptying of the gall-bladder. Curcumin passes through the liver into the intestines and is eliminated by the kidneys, after either intravenous or oral administration. Clinically, oral administration of preparations containing curcumin shows remarkably good results in chronic cholecystitis. In this series of observations, these results were obtained by oral administration of curcunat under very slight dietary restrictions, without any other therapy, and in ambulant patients. The clinical observations have been confirmed, in 18 cases, by radiography before and after treatment. Ill effects have not been seen. It seems justifiable, therefore, to conclude that the treatment with curcunat is a valuable contribution to the therapy of chronic cholecystitis and allied diseases.

BIBLIOGRAPHY

Fähndrich, H. A. (1932) *Fortschr. Ther.* **8**, 606.
Franquelo, E. (1933) *Münch. med. Wschr.* **80**, 524.
Guttenberg, A. (1927) *Z. ges. exp. Med.* **54**, 542.
Helmy, W. (1935) *Med. Welt*, **9**, 90.
Henning, N., and Künzel, O. (1934) *Münch. med. Wschr.* **81**, 1611.
Kalk, H., and Nissen, K. (1931) *Dtsch. med. Wschr.* **62**, 1613.
Koch, R. (1927) *Münch. med. Wschr.* **74**, 972.
Leclerc, H. (1935) *Fr. méd.* **43**, 1760.
Loeber, C. C. (1748) De curcuma officinarum, &c., Halae.
Potter van Loon, J. (1934) *Geneesk. Tijdschr. van Ned.-Ind.* **74**, 782.
Shortt, T. (1867) *Madras quart. J. med. Sci.* **12**, 170.
Stefan, R. (1934) Quoted by Vetterlein.
Vetterlein, S. (1935) *Dtsch. med. Wschr.* **61**, 964.
von den Velden, R. (1934) *Fortschr. Ther.* **10**, 725.

THE ANTI-CURARE ACTION OF SUBSTANCE 36

CLOSELY RELATED TO PROSTIGMIN

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Although the antagonism between curare and eserine is well known, its exact mechanism has not been settled. The resemblance between mild curare-poisoning and myasthenic weakness is close, but it must be remembered that their identity has not been proved. This resemblance has led to the administration of eserine and its analogues to cases of myasthenia gravis. One analogue, Prostigmin, has been used successfully for the temporary alleviation of symptoms (Walker 1934, 1935) and shows the same antagonistic action to curare as eserine. Another analogue, Substance 36,* has given an anti-myasthenic effect almost as good as that of prostigmin (Laurent 1935), but, according to Aeschlimann and Reinert (1931) it has no anti-curare action. This discrepancy appeared to add to the problem another factor—how to explain the action of a drug which could relieve one condition and not the other. It will be shown that this added complication is unnecessary.

The matter is one of some clinical interest. There might well be hesitation in using a drug which differed in one important particular from the rest of its group. Dr. Laurent informs me that he has used the drug for many months and that in some respects it has distinct clinical advantages over prostigmin. It can be given in larger doses, up to 2·5 mg. subcutaneously without atropine. Although its initial effect is less than that of prostigmin, its action is more prolonged and it is therefore valuable for nocturnal administration. Patients who suffer from insomnia and nocturnal dyspnœa wake up in a more comfortable condition after an overnight dose of Substance 36, for they are still partly under the influence of the drug.

PRESENT INVESTIGATION

Aeschlimann and Reinert used changes of threshold to test antagonism. It seemed worth while to test for antagonism by experimental methods already described for curarine and prostigmin (Briscoe 1936).

* Methyl-phenyl-carbamic ester of 3-oxyphenyl-trimethyl-ammonium-methyl sulphate is Substance 36 in Aeschlimann and Reinert's nomenclature. Prostigmin differs only by the substitution of another methyl group for the phenyl group. I am indebted to the makers, Roche Products Ltd., for a supply of Substance 36, which is not on the market.

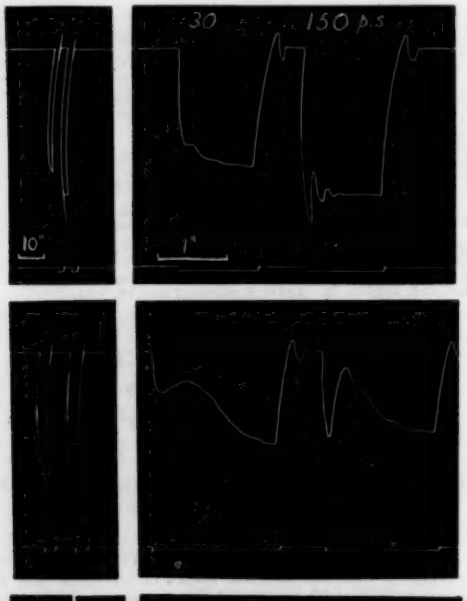

FIG. 1.—Cat. Quadriceps. Dial. Contraction is downwards in all tracings. Submaximal stimuli at 30 and 150 per sec. shown first on slow drum, then on quick. In each case the slow rate precedes the fast rate.
Top row.—Controls in normal muscle.
Middle row.—Effect of 1·5 mg. per kg. of Substance 36. Grading reversed and well-marked notches. (With supramaximal stimuli 150 per sec. produced twitchlike responses and no plateau formation.) Slow drum record taken 8 minutes, and quick drum record immediately, before giving curarine (0·2 mg. per kg.).
Bottom row.—Slow drum: (A) 20–30 sec. after curarine injection. Contractions equal and notch effect less marked, (B) 1½ min. later. Return to normal grading. Quick drum, 40 sec. after injection of antagonising dose. The response to 150 per sec. is already larger than the response to 30 per sec. and the notches have nearly disappeared.

Different rates and strengths of stimuli are used and changes in shape and size of the myograms noted following administration of drugs.

The test muscle is the quadriceps of the cat, in situ, with circulation intact. The femur is fixed in a vertical position and the movement of extension of the knee recorded by a thread attached to the patellar tendon. The cut nerve is stimulated by neon lamp discharges, which can be readily controlled both in strength and frequency (Briscoe and Leyshon 1929).

Large doses of Substance 36 cause characteristic depressant effects in that fast rates of stimulation produce smaller responses than slow rates—that is, normal grading is reversed. The fast-rate myograms are not maintained but become twitch-like, especially with strong stimulation. The shape of the initial curve of contraction is also altered, giving a notched effect. These changes are almost the same as those seen in prostigmin and eserine depression (Briscoe 1936).

Antagonism between curarine and Substance 36 has been shown in each of nine experiments. It is immaterial which drug is given first.

Substance 36 preceding curarine.—The depressant effects of Substance 36 can be counteracted by a moderate dose of curarine. Complete restoration of the myograms is difficult to achieve, but a constant result has been the return to normal grading—i.e., fast rates again cause larger contractions than slow rates. Fig. 1 shows reversals in magnitude of contraction. The notched effect produced by Substance 36 is almost obliterated 40 seconds after injection of curarine. The effects of Substance 36, unless antagonised by curarine, can be traced in the myograms for several hours after injection.

Curarine preceding Substance 36.—(*a*) In a lightly curarised animal the responses to a fast rate of stimulation (150 per sec.) give way much more rapidly than in the normal animal, resembling closely the myograms seen in myasthenic patients (Pritchard 1933). A dose of Substance 36 (0·5 to 0·75 mg. per kg.) injected intravenously causes a quick recovery and the myogram is restored in a few minutes (Fig. 2). A similar degree of recovery due to gradual elimination of curarine would take an hour or more, as shown by control experiments. (*b*) Recovery from a dose of curarine sufficient to cause a temporary paralysis is hastened by Substance 36. In three control experiments with paralytic doses the intervals between the injection of curarine and the reappearance of ability to maintain a contraction for 5 seconds (in response to maximal stimuli at 30 per sec.) were 51, 40, and 44 minutes. When a dose of Substance 36 was given during paralysis this stage of recovery was reached 20 minutes after injection of the curarine.

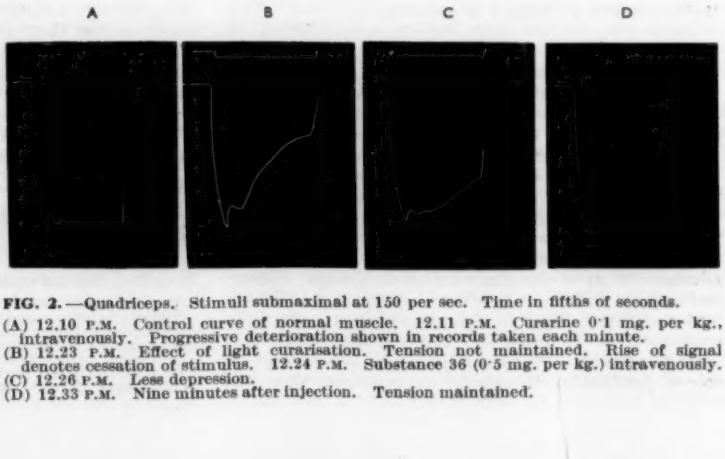

FIG. 2.—Quadriceps. Stimuli submaximal at 150 per sec. Time in fifths of seconds.
(A) 12.10 P.M. Control curve of normal muscle. 12.11 P.M. Curarine 0·1 mg. per kg., intravenously. Progressive deterioration shown in records taken each minute.
(B) 12.23 P.M. Effect of light curarisation. Tension not maintained. Rise of signal denotes cessation of stimulus. 12.24 P.M. Substance 36 (0·5 mg. per kg.) intravenously.
(C) 12.26 P.M. Less depression.
(D) 12.33 P.M. Nine minutes after injection. Tension maintained.

DISCUSSION

By using the experimental methods described the antagonism of curarine to Substance 36 is shown to

be as definite as is its antagonism to eserine and prostigmin. The three drugs can be grouped together as far as their reactions to overdosing and curarine are concerned.

The failure of Aeschlimann and Reinert to detect antagonism may be explained on the following ground, as far as can be judged from the single protocol given by them. In a cat (2·7 kg.) experiment they gave 20 mg. of curare, divided into three doses, intravenously and produced a paralysis in 18 minutes. Two minutes later 0·5 mg. of prostigmin was given and in another two minutes a minimal twitch appeared, at 11.34. At 14.15 a dose of 10 mg. of curare was given producing paralysis in 10 minutes. A dose of 3 mg. of Substance 36 one minute later produced no effect, but 0·5 mg. of prostigmin 26 minutes later was followed in two minutes by the reappearance of a twitch. During the interval of 26 minutes there had been a considerable elimination of curare and it is quite possible that a second dose of Substance 36 would have produced as good a result as the prostigmin. It is even possible that the muscle was on the point of emerging from the paralysis without the help of any antagonising drug.

Some figures obtained in a control experiment of repeated doses of curarine are of interest.

At 10.50, 0·3 mg. per kg. of curarine was injected intravenously. This did not produce complete paralysis but small twitch-like responses. At 11.41 a contraction, due to a strong slow rate, could be maintained for 5 seconds. At 11.44 a similar dose was given, producing paralysis at once. The first twitch-like responses reappeared in 24 minutes. A third similar dose at 12.53 again produced paralysis at once and twitches reappeared in response to strong slow stimuli in 29 minutes.

It has been noticed repeatedly that a second dose of curarine given after apparent recovery, even if half the strength of the first, produces a more profound depression. This observation gives an explanation for the success of the first immediate dose of prostigmin in Aeschlimann and Reinert's experiment and the failure of Substance 36 to antagonise the effect of a second dose.

During paralysis it is impossible to know the depth of depression and the time when recovery starts. It is advisable to use subparalytic doses so that a continuous record of the myographic changes can be maintained.

SUMMARY

Substance 36, an analogue of eserine and closely related to prostigmin, has anti-curare properties as well marked as those of eserine and prostigmin. An explanation is offered of Aeschlimann and Reinert's failure to detect this antagonism.

REFERENCES

Aeschlimann, J. A., and Reinert, M. (1931) *J. Pharmacol.* **43**, 413.
Briscoe, G. (1936) *Lancet*, **1**, 469.
— and Leyshon, W. A. (1929) *Proc. roy. Soc. B.* **105**, 259.
Laurent, L. P. E. (1935) *Brit. med. J.* **1**, 463.
Pritchard, E. A. B. (1933) *J. Physiol.* **78**, 3 P.
Walker, M. B. (1934) *Lancet*, **1**, 1200.
— (1935) *Proc. R. Soc. Med.* **28**, 759.

MANCHESTER DENTAL HOSPITAL.—Mr. Samuel Turner of Rochdale has offered to defray the cost of erecting a new dental hospital in Manchester which is to be three times the size of the old one. Mr. Turner made a substantial donation towards the establishment of a chair of dental surgery in the University three years ago. The new hospital will include a children's clinic, a special department for the treatment of pyorrhœa and other chronic infections of the mouth, and full facilities for research.

SPORADIC SALMONELLA INFECTIONS

WITH A CASE REPORT

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THE salmonella group of organisms contains many varieties which are closely related culturally, biochemically, and serologically. The most recent classification is that of the salmonella subcommittee of the nomenclature committee of the International Society for Microbiology (Salmonella Subcommittee 1934). Clinically, however, they may be divided into two main groups, the typhoid and the food-poisoning.

The typhoid group contains *Bacillus typhosus* and *Bacillus paratyphosus* A, B, and C. The type of illness produced by the paratyphoid organisms is very similar to that of typhoid, the chief difference being that the course is usually shorter and less severe.

Of the many members of the second, food-poisoning, group, only a few are to be commonly found as the cause of outbreaks of food poisoning, the remainder being met with only on rare occasions. The type of illness usually seen is one of sudden onset, with vomiting, abdominal pain, and diarrhœa. There may be collapse, cold sweats, and rigors, and herpes and rashes have been noted in certain epidemics. Usually the symptoms begin to diminish after a few days, but occasionally they persist for several weeks. In epidemics and family infections this is the clinical picture usually seen. Sporadic cases, however, occur quite often, and give rise to many different clinical pictures.

Smith (1934) reported two cases of infection with *Salmonella dublin*. The first patient, a child of 7 months, died from meningitis, the organism being isolated from the blood and cerebro-spinal fluid. The second died with multiple lung abscesses and empyema, the organism being isolated from the blood stream and pus from the empyema. An examination of the fæces was negative.

Küttner and Zepp (1933), in a paper dealing with sporadic cases of *Salmonella suipestifer* infections in man, noted a very varied clinical picture, pneumonia, arthritis, cystitis, and meningitis being reported. Of the 11 cases, 10 were due to European suipestifer (*Salmonella choleræ-suis* var *kunzendorf*), and 1 to the American suipestifer (*S. choleræ-suis*). Boycott and McNee (1936) report a case of septicæmia and meningitis due to American suipestifer. Biddle (1930) reports a sporadic case of European suipestifer septicæmia, and many other single cases of septicæmia and cystitis due to *S. suipestifer* of both European and American types have been recorded. On the other hand, Scott (1926) reports four outbreaks of food poisoning due to *S. suipestifer*, European type, with over 100 cases, and all showed symptoms of acute gastro-enteritis.

Clayton and Milne (1930) report a mass infection of seven out of eight persons who had consumed an infected pork pie, due to American suipestifer, and all had symptoms of acute gastro-enteritis. This contrasts the fairly constant clinical picture in epidemics and mass infections with the varied picture not infrequently seen in sporadic cases.

A sporadic case of infection by *Salmonella enteritidis*, Gaertner, running a course closely simulating typhoid, was reported by Rosher and Wilson (1921).

Salmonella aertrycke is the organism most commonly responsible for food poisoning in England, but the clinical course taken is usually that of an acute enteritis, although on occasion it has been found to produce a long-continued septicæmia. Solly and Henderson (1928) report a sporadic case which died after an illness of twenty days, with symptoms of

acute mania. A blood culture taken post mortem was positive for *S. aertrycke*.

CASE REPORT

The case was a single isolated one, in which we were unable to determine the source of infection.

The patient, a man aged 48, was admitted to hospital on August 20th, 1935. Previous illnesses: typhoid fever 21 years ago. The illness commenced suddenly with vomiting, generalised abdominal pains, and diarrhœa 8 days before coming to hospital.

On admission he appeared ill. He was drowsy and complained of severe frontal headache. The vomiting and abdominal pains had ceased, but the diarrhœa persisted for a few days. His tongue was coated with a dry brown fur. The abdomen was distended and tympanitic, but there was no tenderness, and the spleen was not palpable. An examination of the chest, heart, and nervous system revealed no abnormality. The pulse-rate was 92 and temperature 101° F.

Investigations.—The urine was clear. The stools were very relaxed, but no abnormal organisms were found in repeated examinations. The leucocyte count was 8000. Agglutination tests showed weak agglutination with the salmonella group suspension. Blood culture, taken the day after admission, was positive for *S. aertrycke* (*Salmonella typhi-murium*). The patient's serum 8 days later agglutinated *S. aertrycke* in a dilution of 1 in 2500.

Progress.—The diarrhœa ceased 2 days after admission and did not recur. The temperature remained high and continuous for 9 days, coming down by crisis. During this time his general condition became gradually worse, and no improvement was shown with the fall of temperature. He developed severe pains in the shoulders and lower cervical spine, which were persistent and unrelieved by salicylates. He became mentally confused and lost sense of time and place, and he was doubly incontinent. The urine was found 18 days after admission to contain large quantities of blood and pus, and on culture *S. aertrycke* was isolated.

On the 27th day after admission the temperature, after having been normal for 18 days, rose again to 101° F., and varied between 101° and 102° F. for a week, gradually returning to normal after 15 days. A blood culture was done and *S. aertrycke* isolated. Agglutination tests showed agglutination of *S. aertrycke* (specific) in a dilution of 1 in 2560, and of the group suspension in 1 in 5120. The organism isolated from the blood stream was agglutinated by the patient's serum in a dilution of 1 in 640. An examination of the nervous system now revealed much exaggerated knee-jerks and ankle-jerks, and a double extensor response. The reflexes of the upper limbs were normal. The abdominal reflexes were sluggish but all present. Owing to the patient being so very ill only a superficial examination of the sensory system was obtained, but no abnormality was detected The temperature fell by lysis and became normal 42 days after admission, after when the patient gradually began to improve, and was discharged to a convalescent home 125 days after admission. The urine showed the presence of *S. aertrycke* for 3 months, but three specimens examined later at monthly intervals were negative.

Result.—The patient now, 14 months after the onset of the infection, feels quite well, and his only complaint is that he is not quite so strong on his legs as before his illness. The knee-jerks and ankle-jerks are still much exaggerated, and there is a double extensor response. The reflexes of arms are normal, and abdominal reflexes are present. The blood Wassermann reaction is normal, and the cerebro-spinal fluid normal in all respects.

SUMMARY OF UNUSUAL FEATURES

(1) The length of duration, 4 months, and severity of the illness.

(2) The failure to find the organism in repeated examinations of the fæces.

(3) The isolation of the organism from the blood stream at the commencement of the illness, and again 27 days later, when there was a secondary rise of temperature after it had been normal for 18 days. The invasion of the blood stream in both cases was transitory, as examinations repeated in each case 2 days later were negative.

(4) The invasion of the urinary tract, and persistence of the organism in the urine for 3 months.

(5) Arthralgia of shoulders and cervical spine.

(6) The neurological signs—weakness of the legs with increased deep reflexes and double extensor responses, the arms being unaffected—suggesting a myelitis.

COMMENT

These invasive clinical pictures, where the course taken resembles typhoid fever, are seen only amongst the sporadic cases, and it is therefore important to consider the factors which may give rise to a sporadic case, and which, if any, of these factors could be responsible for the unusual clinical pictures so often seen.

The factors which might give rise to a sporadic case are:

(1) The patient may have eaten more of a particular dish than the rest of the family.

(2) The bacilli might be distributed unequally in the food.

(3) The alimentary tract might be less resistant, possibly due to a previous infection of gastro-enteritis.

(4) The patient may be specially susceptible to the organism.

(5) The resistance of the patient may be lowered by some factor—for example, an operation, with activation of latent bacilli.

Cases have been reported following operations. Biddle (1930) reports a case of *S. suipestifer* septicæmia discovered in a patient six days after an operation for a ruptured ectopic gestation. Küttner and Zepp (1933) report a case of *S. suipestifer* septicæmia and cystitis occurring in a patient following a radical antrum operation. Elkeles and Standfuss (1931) explain the rare cases following operation as being due to an activation of latent bacilli in the bowel. Increased dosage or increased virulence of the organism cannot be the explanation of the more invasive clinical pictures, as they should then occur also in the epidemic cases.

An individual hypersusceptibility might explain both the sporadic nature of a case and also the unusual invasive clinical picture. However, if this were the true explanation, a proportion of such hypersusceptible individuals should be amongst those attacked in epidemic outbreaks.

A lowering of the resistance of the patient, with activation of latent bacilli, would explain both the sporadic nature of the attack and the varied clinical picture.

The resistance of the patient being low, the organism quickly enters the blood stream, and may invade the bladder, meninges, lungs, or joints without in many cases attacking the gastro-intestinal tract. There is also the possibility that organisms which have been lying latent in the body may, as the result of time and adaptation to an altered environment, become more virulent, and so resemble in their invasive properties the closely related typhoid and paratyphoid members of the group. An activation of latent bacilli would also render the determination of the original source of infection impossible, and the difficulty of finding the source of infection is a characteristic feature of sporadic cases.

As noted by Smith, it appears that of the salmonella organisms commonly met with *S. dublin* and *suipestifer* are much more frequently the cause of septicæmic manifestations than are *S. enteritidis* Gaertner, *S. thompson*, and *S. aertrycke*. The case of aertrycke infection described here however, in its course and complications, resembled a severe typhoid infection,

and it appears that any of these closely related organisms may under certain conditions invade the blood stream and give rise to any of the symptoms or complications seen in infections by the typhoid group.

SUMMARY

1. The clinical picture in sporadic salmonella infections is very variable, and cases where the organism invades the blood stream and the course taken resembles typhoid fever are not uncommon.

2. This contrasts with the fairly constant clinical picture of gastro-enteritis seen in epidemics and family infections.

3. A sporadic case of *S. aertrycke* infection is described, in which the illness resembled a severe case of typhoid fever.

4. A lowering of resistance with activation of latent bacilli is suggested as an explanation of the typhoid-like illness seen in some sporadic cases. It is also possible that the bacilli as a result of time and adaptation to an altered environment become more virulent, and so resemble in their invasive properties the closely related typhoid and paratyphoid members of the group.

5. Cases following operations support this explanation.

6. *S. dublin* and *suipestifer* show a much greater tendency to undergo this change than do the other members of the group commonly met with—*S. enteritidis* Gaertner, *thompson*, and *aertrycke*.

I desire to express my thanks to Dr. A. B. Rosher for his assistance in the bacteriological investigations involved, and to Dr. J. G. Leebody, medical superintendent of St. George-in-the-East Hospital, for his permission to publish the case.

REFERENCES

Biddle, E. (1930) *Brit. med. J.* **2**, 685.
Boycott, J., and McNee, J. W. (1936) *Lancet*, **2**, 741.
Clayton, E. S., and Milne, V. E. (1930) *Brit. med. J.* **2**, 685.
Elkeles, G., and Standfuss, R. (1931) in Kolle and Wassermann's Handbuch der pathogenen Mikroorganismen, vol. iii., p. 1682.
Küttner, A. G., and Zepp, H. D. (1933) *J. Amer. med. Ass.* **101**, 269.
Rosher, H. B. R., and Wilson, G. S. (1921) *Lancet*, **1**, 16.
Salmonella Subcommittee (1934) *J. Hyg.* **34**, 333.
Scott, W. M. (1926) *Ibid*, **25**, 406.
Smith, J. (1934) *Ibid*, **34**, 351.
Solly, R. V., and Henderson, J. M. (1926) *Brit. med. J.* **1**, 421.

HERNIO-APPENDICECTOMY

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More than one attempt has been made to devise an extraperitoneal approach for the radical cure of hernia. The most successful is probably Lotheissen's operation for femoral hernia. A. K. Henry (1936) has described a midline incision for dealing with both femoral and inguinal herniæ by the extraperitoneal route which he claims may be used effectively even in difficult cases.

It is likely nevertheless that the Bassini operation, or some modification of it, will remain the operation of choice for inguinal hernia in persons over 25 and in all complicated cases. In children, on the other hand, and probably in young adults, all that is necessary is removal of the sac, the whole sac, and nothing but the sac. If one were to propose any departure from these well-established principles, it would be necessary to show that the innovation was equally innocuous, equally efficient, and, further, that it provided some specific advantage not to be attained by the more orthodox methods. The operation about to be described has been confined so far in the main to children over 2 and young adults, and I do not at present feel inclined to advocate its extension to older patients or complicated cases. In the hands of those accustomed to operating on young children I see no reason why the procedure should not be carried out more often at an even earlier age.

The position of the internal ring is identified just above Poupart's ligament midway between the anterior superior spine and the middle of the crest of the pubis. A finger's breadth above the ring the usual oblique incision is made, in length perhaps 1½ inches. The external and internal oblique muscles are split in the line of their fibres; the lower border of the transversalis usually lies at a higher level, and can be hooked up out of the way. The extraperitoneal tissues are now reached and the rounded bulging edge of that membrane can be seen giving off a process, which passes at once into the internal abdominal ring. This is, of course, the hernial sac. It is picked up with forceps and carefully cleaned as in any other operation for hernia. It should be noted that in young children even a small amount of pull on the sac with its attached cord may drag the testis up into the canal. After one's manipulations are completed in these little patients one ought to make certain therefore that the testis has not been displaced.

The cleaning of the sac is begun on the inner side, and here lying well to the back will be found the vas deferens to the outer side of which, behind the sac, are placed the spermatic vessels. The isolated sac is cut across, the distal end neglected, and the edges of the proximal opening secured with forceps. If necessary the peritoneal aperture may be enlarged. It is usually easy to secure the cæcum with Duval's forceps, but if it fails to appear it can be identified with the finger and so captured. The appendix, if normal, can then be removed, but if adhesions give rise to difficulty, I consider one is amply justified in enlarging the muscle wound to give proper access to the iliac fossa. At the end of the operation the peritoneum is closed, the internal oblique drawn together with a single stitch, and the external with two.

It can be claimed, with confidence I think, that the three considerations needed to justify an innovation of this kind have been satisfied. There could hardly be any procedure less injurious to the abdominal wall, and although I would hesitate to make claims for its infallibility it is theoretically sound. I can only state that, during the ten years or more during which I have practised it, I have not seen or heard of any suggestion of recurrence. The specific advantage gained is, of course, easy access to the appendix without unduly prolonging the operation or prejudicing its success. In this connexion it should be mentioned that Torek in 1906 urged that when in the right inguinal region the surgeon should take the opportunity of removing the appendix, and others following him have supported this view. They point out—and in my earlier cases I took pains to confirm this observation—that the appendix is abnormal in a surprising proportion of cases. Even more important, however, is the problem of prophylaxis. Every surgeon, I think, is agreed that when in the course of an operation the appendix can be removed without detriment to the patient this should be done. The operation just described claims to bring radical cure of hernia in certain cases into the category of such operations.

In Torek's procedure an extension of the hernia incision was made in an upward and outward direction to enable the surgeon to make a small gridiron

opening through the muscles and so remove the appendix. It was a gridiron appendicectomy superimposed on whatever type of herniotomy the surgeon might favour. In the procedure I describe the approach to the appendix is an integral part of the radical cure.

REFERENCES

Henry, A. K. (1936) *Lancet*, **1**, 531.
Torek, F. (1906) *Ann. Surg.* **43**, 665.

SULPHÆMOGLOBINÆMIA FOLLOWING SULPHANILAMIDE TREATMENT

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Prontosil Album and other brands of sulphanilamide (which is another name for *p*-aminobenzenesulphonamide, *p*-aminophenylsulphonamide, or sulphonamide-P) have been used generally for some months. Trefouél and others (1935) and Fuller (1937) have shown that the soluble red azo-dye Prontosil Soluble (for injection) and the almost insoluble orange azo-dye Red Prontosil (oral) are bactericidal only after reduction to sulphanilamide. For this reason, and to avoid the pain associated with the injections of prontosil soluble, many workers have used sulphanilamide alone, which can be taken by mouth.

At first this substance was believed to be non-toxic: later it was found to produce occasional cases of sulphæmoglobinæmia (Colebrook and Kenny 1936a, three cases; Foulis and Barr 1937, two cases; Thomas 1937; Frost 1937, one case each). Frost did not use sulphanilamide, but prontosil soluble and N-benzyl sulphanilamide (Proseptasine) on which no other clinical reports have so far been published. The impression given by these three papers is that sulphæmoglobinæmia may be an occasional complication of sulphanilamide treatment, but that it is unusual.

When one case of extreme cyanosis following sulphanilamide was recognised at St. Bartholomew's Hospital, all patients who were receiving, or who had recently received, that substance were carefully examined. Of seven patients who had received over 5 grammes, six showed some degree of sulphæmoglobinæmia, three showing marked cyanosis. All these patients received the Prontosil brand of sulphanilamide. It appears that sulphanilamide is one of the most active drugs for the production of sulphæmoglobinæmia at our disposal.

Of these seven patients, four (Nos. 1, 2, 3, and 4) received frequent doses of magnesium sulphate; two of these (Nos. 1 and 4) developed cyanosis, while two (Nos. 2 and 3) showed a less degree of sulphæmoglobinæmia. One patient (No. 5) who developed cyanosis received only two doses of magnesium sulphate; and one (No. 6) which received no magnesium or sodium sulphate by mouth, but who did have dressings of sodium sulphate on a large gangrenous area, developed a very slight sulphæmoglobinæmia. The one patient (No. 7) who did not show any abnormal pigments in the blood, in spite of long-continued sulphanilamide treatment had no sulphates by mouth or as a dressing during the treatment. None of the patients affected has died; all are recovering.

CASE REPORTS

CASE 1.—Mrs. A., aged 31. Panophthalmitis, multiple streptococcal abscesses, following lobar pneumonia. Admitted on Jan. 1st, 1937, having had prontosil album for three days previously. Between Jan. 23rd and Feb. 15th received a total of 41·4 grammes of sulphanilamide, or 1·8 g. daily. Between Jan. 26th and Feb. 5th, received also 85 c.cm. prontosil soluble, or 2·125 g. Received magnesium sulphate at irregular intervals during this period. On Feb. 15th cyanosis of the lips and fingernails was observed and on the 18th this was shown to be due to sulphæmoglobinæmia. The appearance of the patient at this time was characteristic; the lips and nail-beds a cold blue, the face very pale; the blood, even after shaking with air, remained a deep brown. It was indeed surprising to find her cheerful and talkative, not in the least worried or inconvenienced by her condition. No quantitative estimation was possible at this time, but the strength and persistence of the α-band of sulphæmoglobin suggested that at least 40 per cent. of the hæmoglobin present was in that inert form.

CASE 2.—Miss B., aged 19. Mastoiditis; Schwartze operation. Received 16·2 g. sulphanilamide between Feb. 9th and 19th (1·8 g. daily). Magnesium sulphate was given irregularly between Feb. 1st and 16th. On the 19th a faint band due to sulphæmoglobin was seen in the patient's shed blood. There was no cyanosis and she left hospital on the 20th.

CASE 3.—Miss C., aged 20. Lupus erythematosus; suspicion of pulmonary tuberculosis. Between Feb. 3rd and 18th received 27 g. sulphanilamide (1·8 g. daily). Magnesium sulphate was given irregularly during this period. On Feb. 18th the α-band of sulphæmoglobin was observed in the patient's shed blood. It was stronger than that shown by Case 2, but there was no cyanosis.

CASE 4.—D. E., aged 21. Mastoiditis; Schwartze operation; lateral sinus thrombosis; osteomyelitis; resection of the third right costal cartilage. Between Feb. 4th and 18th received 25·2 g. sulphanilamide (1·8 g. daily). Magnesium sulphate was given daily from Jan. 31st until Feb. 21st, except on the 12th. On the 18th obvious cyanosis was present, shown to be due to sulphæmoglobin by spectroscopic examination on the 20th. In this case the blood showed a brown tint, though less than that from Case 1.

CASE 5.—Mrs. F., aged 51. Streptococcal abscess left thumb. Pus contained hæmolytic streptococci. Between Feb. 13th and 26th received 25·2 g. sulphanilamide (1·8 g. daily). On Feb. 19th and 21st magnesium sulphate was given. Examination on Feb. 22nd had shown no evidence of sulphæmoglobinæmia; yet on the 26th the patient developed cyanosis, almost as severe as in Case 1. Her blood was brown, even to the untutored eye, and showed an intense α-band of sulphæmoglobin. On Feb. 13th and 14th polyvalent antistreptococcal serum had been injected, and a serum reaction, with fever and an urticarial rash, developed on the 21st, 22nd, and 23rd. This may have some relation to the sudden onset of cyanosis.

CASE 6.—Miss G., aged 15. Gangrene of chest following chicken-pox; pus contained hæmolytic streptococci. Between Feb. 16th and 26th received 18 g. sulphanilamide (1·8 g. daily). No magnesium or sodium sulphate was given by mouth, but sodium sulphate dressings were applied to the gangrenous area. On Feb. 27th a faint, but easily seen, band of sulphæmoglobin was detected in the patient's blood.

CASE 7.—H. I., aged 28. Osteomyelitis of the left maxilla. Between Jan. 25th and Feb. 18th he received 41·4 g. sulphanilamide (1·8 g. daily). No magnesium or sodium sulphate was given by mouth or in dressings. No sulphæmoglobin could be detected on the 18th or 23rd.

CASE 8.—J. K., aged 10. Mastoiditis; Schwartze operation; diabetes mellitus. This boy had only 2·7 g. sulphanilamide in three days and occasional doses of sodium and magnesium sulphates. No sulphæmoglobin was found, and this case is not included in the discussion on account of the small total dose and short period of administration.

DISCUSSION

The occurrence of sulphæmoglobinæmia in 6 out of the first 7 cases undergoing a moderately

long course of sulphanilamide treatment may be fortuitous; it seems far more probable that it represents a genuine correlation, and that the occasional frank cyanosis is due to a quantitative rather than qualitative difference in the action of the drug. The results presented here neither confirm nor deny the suggestion (Colebrook and Kenny 1936a, following van den Bergh and Revers 1931) that there is some connexion between magnesium sulphate and the development of sulphæmoglobinæmia in sulphanilamide-treated patients. It is hoped that in the near future it will be possible to present a series of cases treated with sulphanilamide which have had no sulphates either by mouth or as dressing.

The cyanosis caused by sulphæmoglobin is spectacular and alarming, but fortunately it does not produce any very serious consequences if the drug is stopped as soon as it is noticed; in the three cases described here the patients were annoyed when attention was drawn to their condition, but not in the least perturbed. The only troublesome consequence is that the stay in hospital may be prolonged. All these three had fairly high hæmoglobin figures, the lowest being 48 per cent. This condition may be dangerous, however, if the total hæmoglobin percentage falls below about 30 per cent. (Haldane scale), for then cyanosis cannot occur and the drug responsible for the sulphæmoglobinæmia may be continued until over half the total hæmoglobin present is changed to the inert form; the plight of a patient with a streptococcal infection and about 15 per cent. active hæmoglobin may easily be imagined.

For this reason it is impossible to regard a careful watch for cyanosis as a sufficient precaution. The total hæmoglobin should be determined and the patient's blood should be examined regularly at intervals of less than four days (cf. Case 5). It is best to examine the shed blood, diluted with water or ammonia; but quite small quantities of sulphæmoglobin can be detected by examining the blood in the lobe of the ear, using a torch and direct-vision spectroscope, as described by Harrison (p. 294). The necessary skill may be acquired by a little practice.

There can be no doubt that in these cases sulphæmoglobin, not methæmoglobin, was present. It is found that dilution of blood with 0·4 per cent. ammonia destroys the α-band of methæmoglobin, but does not affect that of sulphæmoglobin; all specimens of blood were examined in water and in 0·4 per cent. ammonia. One or more other tests were made on each blood; persistence of the α-band on treatment with reducing agents (ammonium sulphide, sodium hydrosulphite); shift of the α-band towards the violet on treatment with carbon monoxide; matching the α-band in the Hartridge reversion spectroscope with that of sulphæmoglobin artificially prepared from normal blood. One sample of blood was submitted to all these tests by Dr. G. A. Harrison (Case 1).

Thanks to the work of Tréfouel et al. (1935), Colebrook et al. (1936), Fuller (1937), and others referred to in their papers, some knowledge is being obtained as to the mode of action and suitable uses of sulphanilamide. So far its advantages seem heavily to outweigh its dangers, and its use is being limited and extended as more knowledge is obtained. It is, however, very important to be alert to all possible complications, and the possibility of grave anoxia due to unrecognised occurrence of sulphæmoglobinæmia should be borne in mind, while till more information is available, the administration of magnesium or sodium sulphate to sulphanilamide-treated patients should be forbidden.

SUMMARY

(1) Sulphæmoglobinæmia is a commoner consequence of sulphanilamide treatment than has hitherto been recognised. (2) Sulphæmoglobinæmia is dangerous to anæmic patients. (3) Regular spectroscopic examination of the blood of all patients receiving sulphanilamide is therefore advocated.

My thanks are due to those members of the honorary staff of St. Bartholomew's Hospital, Prof. J. Paterson Ross, Dr. A. C. Roxburgh, Mr. Sydney R. Scott, and Mr. R. Foster Moore, who have given me permission to publish details of their cases; to their house surgeons; to Dr. G. A. Harrison and Dr. H. E. Archer, for their advice and assistance; and to the nursing staff, especially to Miss Capon.

REFERENCES

Colebrook, L., and Kenny, M. (1936a) *Lancet*, **1**, 1279.
— — (1936b) *Ibid*, **2**, 1319.
— Buttle, G. A. H., and O'Meara, R. A. Q. (1936) *Ibid*, **2**, 1323.
Foulis, M. A., and Barr, J. B. (1937) *Brit. med. J.* Feb. 27th, p. 445.
Frost, L. D. B. (1937) *Lancet*, Feb. 27th, p. 510.
Fuller, A. T. (1937) *Ibid*, Jan. 23rd, p. 194.
Harrison, G. A. (1930) Chemical Methods in Clinical Medicine, London, 1930.
Thomas, J. McQ. (1937) *Proc. R. Soc. Med.* **30**, 410.
Tréfouel, J., and Mme. Nitti, F., and Bovet, D. (1935) *C. R. Soc. Biol. Paris*, **120**, 736.
Van den Bergh, A. A. H., and Revers, F. E. (1931) *Dtsch. med. Wschr.* **57**, 706.

Clinical and Laboratory Notes

COMA AS THE FIRST SYMPTOM OF DIABETES

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DIABETIC coma, in spite of insulin, is very often fatal and usually presents difficulties. The case to be described may be of interest, because it showed one feature that I had always considered a sign that death was certain—namely, commencing anuria—but nevertheless ended in recovery.

So far as could be ascertained, the patient's symptoms began on Thursday, May 30th, with headache and vomiting which were ascribed to dietary indiscretions by her medical man; he ordered a simple laxative régime. Nothing unusual happened until the following Tuesday afternoon (June 4th) when a kind of delirium set in and the doctor was sent for again. She was a woman of 28; the age, sex, and various other circumstances suggested a diagnosis of hysteria, but he was not satisfied that this was really the condition. As she did not improve he asked me to see her the same evening. When I arrived at about 9 P.M. she was lying in bed, semi-conscious and talking nonsense. She had a dry cracked tongue, dry skin, and breath smelling strongly of acetone. By this time the diagnosis was clearly one of diabetic coma and she was sent to hospital at once. The urine had been examined three days previously, when her illness began, and had been found free from sugar and albumin.

When she reached hospital, about 10 P.M., I found the urine (catheter) contained a very large amount of diacetic acid and 8 per cent. of glucose. A blood-sugar estimation, made while the ordinary routine preliminary coma treatment of rectal washouts and glucose-saline enemas was being carried out, gave a reading of 0·57 per cent. (Folin and Wu's method). As she was still just rousable, hot saline and 10 per cent. glucose with 5 per cent. bicarbonate of soda was given by mouth almost continuously, and her nurse was instructed that she must be made to drink at least three pints of this hot saline before morning. At the same time 60 units of insulin was given immediately, to be followed by another 60 units in two hours. As this did not lessen the depth of coma an attempt was

made to give an intravenous glucose saline; but she was a plump girl and the vein could not be found, so a further 100 units of insulin was given intramuscularly, and rectal and oral administration of glucose saline continued.

By the morning she was obviously worse and absolutely comatose; she had stopped passing urine, the temperature was falling (97·2° F.), there was much air-hunger with a very slow respiratory rate and the blood-sugar content was 0·8 per cent. A vein was exposed and intravenous administration of glucose saline begun. She was given two pints of saline with 10 per cent. glucose and 10 per cent. bicarbonate of soda. The rectal saline was continued by means of a Murphy's drip apparatus and insulin was administered in doses of 100 units every four hours. With the idea of trying to counteract the anuria, radiant heat was applied by means of the ordinary electric lamp bed cage for several hours. By the evening of this the second day in hospital (June 5th) there was a suggestion of improvement; the temperature rose to 97·8° F., the tongue was noticeably less dry and cracked. By the following morning (June 6th) she had begun to pass urine again (750 c.cm. during the 24 hours) and coma gradually lessened. At this time the blood-sugar was 0·17 per cent., and during the day she made a complete recovery from coma.

During the 25 hours of really intensive treatment she received 800 units of insulin; the question of giving pituitrin was discussed but finally answered in the negative.

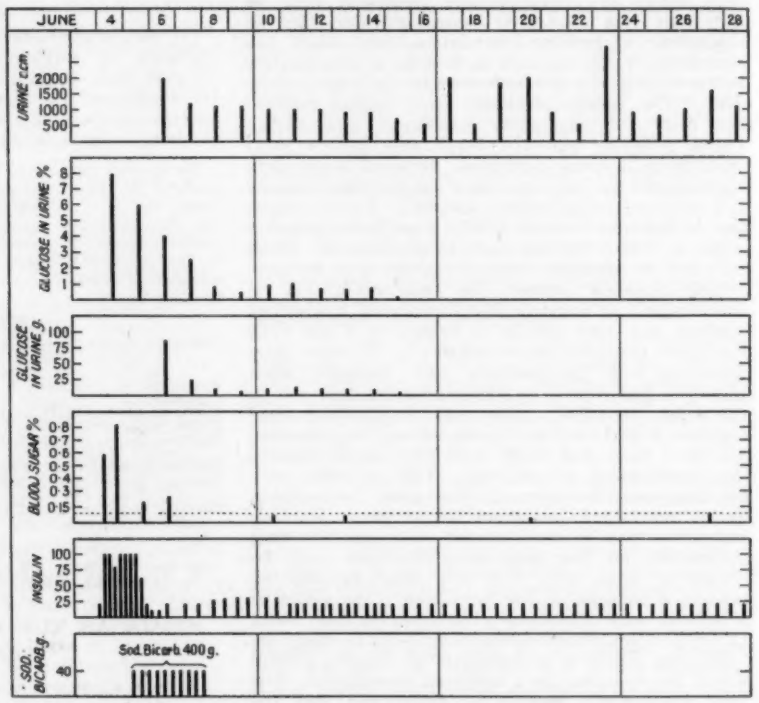


Chart showing the quantities of insulin and sodium bicarbonate given and the changes in secretion of urine, glucose in urine, and glucose in blood.

In an influenza epidemic about the same time I was so unfortunate as to lose three of my old diabetic cases from coma immediately following an attack. Without exception they were all anuric for about 24 hours before death, and the symptom was then impressed on me as a sign of impending fatality. When this symptom appeared in the above case I gave a fatal prognosis to the relatives, and it is of interest to know that the symptom does not necessarily mean that death approaches. We had been on the look-out for anuria from the experience in the three previous cases, and as soon as there appeared to be a diminution in the quantity of urine passed the radiant heat was started.

There are one or two points of interest in the case. First of all the fact that diabetes had not been suspected, there having been no previous ill health. Secondly the development of deep coma was extremely rapid, for coma was complete within eight hours of the onset of the first symptoms. Thirdly the blood-sugar was very high at the time of deepest coma. I have only once seen a blood-sugar value of 0·8 per cent., and this was in an elderly patient who also had chronic granular nephritis and who died of uræmia after recovering from a diabetic coma for a few hours.[1] A further point of interest is the very large dose of insulin given in a few hours. There is no doubt that without insulin this girl would have died, for insulin is the only hope in diabetic coma and even now only becomes a hope if given in sufficiently large doses. The danger of insulin, at any rate in coma cases, lies not in giving too much but in giving too little. The Chart represents the progress of the case for a month, day by day.

The patient now, seven years later, remains well and is doing her work as a checking clerk on the railway. Her diabetes is moderately severe, requiring 30–40 units of insulin daily, and she has been in hospital three times—twice with mild diabetic coma and once with hypoglycæmic coma.

[1] Imrie, C. G., and Skinner, E. F. (1924) *Lancet*, **1**, 14.

ECLAMPTIC HEMIPLEGIA

By Miron Hajkis, M.B. Oslo, L.M. Rotunda

Eclampsia has been known since Moriceau described it in 1688. The rarity, however, of palsies in the clinical picture of the disease stands in striking contrast to the frequency of intracranial hæmorrhage or of areas of softening in the brain. This was pointed out by Schwanen (1934) who collected 34 cases of paralysis in eclampsia and toxæmias of pregnancy, and described three of his own cases.

The central hæmorrhage is a sudden one and the palsy is soon complete (Talley and Ashton 1925), the coma followed by hemiplegia is profound and tenacious (Brindeau 1927). The mortality is 50 per cent., which seems to be independent of the number of fits but determined by the size of the central focus. The patient's age is of no importance in the prognosis (Schwanen 1934). According to Talley

and Ashton only a few of those patients living had permanent palsies left, and even those show improvement. Other causes of central puerperal palsies more frequent than cerebral hæmorrhage are cerebral thrombophlebitis and sinusitis, and cerebral embolism from a septic thrombophlebitis in the pelvis, from a thrombosis of lower extremities either frank or concealed, or from endocarditis. Brain abscess and purulent meningitis as incidents in general septicæmia may also lead to puerperal palsy. Brindeau says that it is usually impossible to diagnose the cause.

The patient was a primipara, a strongly built woman aged 37, who had not been ill previously. A fortnight before labour she had headache, nausea, and heartburn, as well as increasing œdema of the lower extremities. She had not received any antenatal treatment. During the labour, which was at full term, she had 3 series of convulsions, the last of which was just before spontaneous delivery. It was violent, and was followed by 4 hours of deep coma. The child was stillborn.

Even at that time, while the patient was in coma, the right arm and leg were remarkably flaccid, so that it was assumed that hemiplegia was a fact. When she recovered consciousness, total paralysis of the right upper and lower extremities and paresis of the lower portion of the facial musculature of the right side was observed. There were no serious disturbances of speech. Eyes and ears normal. No rigidity of the back and neck. Kernig's and Brudzinski's sign absent. No hyperæsthesia. No clinical evidence of tuberculosis.

The rise in temperature, 100·4–101·8° F., and in the pulse-rate, 92–112, was observed for 5 days. Œdema of the lower extremities disappeared within a week; albuminuria lasted for 3 weeks. On the paralysed side the deep reflexes were increased; Babinski's sign present. The other superficial reflexes were diminished. The sphincters were normal.

The palsy of the spastic type was slow in recovering. It was more than a year before the paralysis had become reduced to the permanent state of limited mobility of the right wrist and fingers, and some muscular atrophy of the hand, the skin on the dorsum being somewhat thin and glossy. Patient now complains of sensations of cold in the hand, which is rather cool to the touch. When working and eating she uses her left hand. She also complains of paræsthesiæ in the right foot, which becomes quickly tired, but there is no paralysis in the leg. The facial paresis has completely vanished.

Two years after the labour she had a normal delivery of a living baby, and she has otherwise been well.

The cause in this case seems to have been a cerebral hæmorrhage, because of the sudden onset of a complete paralysis. A cerebral thrombosis or an embolus —e.g., from a concealed thrombophlebitis in the pelvis—seems to be less probable. There were no signs of septicæmia or endocarditis, and no clinical evidence of thrombosis of lower extremities. The post-partum rise of temperature and pulse-rate must be regarded as a febrile reaction from the cerebral hæmorrhage or the toxæmia.

DeLee (1934) observes that a neurological examination would perhaps reveal a tuberculous or other meningitis instead of that of eclampsia. The investigations carried out in this case, however, rule out the possibilities mentioned by DeLee of diseases other than eclamptic hemiplegia.

REFERENCES

Brindeau, A. (1927) La pratique de l'Art des Accouchements. Paris, vol. ii, pp. 164, 211.
DeLee, J. B. (1934) DeLee and Greenhill's Year Book of Obstetrics and Gynecology. Chicago, p. 173.
Schwanen, H. (1934) *Zbl. Gynäk.* **58**, 1394.
Talley, J. E., and Ashton, D. L. (1925) *J. Amer. med. Ass.* **85**, 26.
Sund, Bergen, Norway.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTIONS OF SURGERY AND RADIOLOGY

THESE sections held a joint meeting on March 3rd, with Prof. G. GREY TURNER, president of the section of surgery, in the chair. Mr. W. SAMPSON HANDLEY opened a discussion on the value of pre- and post-operative

Irradiation in Malignant Disease

with special reference to carcinoma of the breast. He said that post-operative irradiation was of most value in preventing recurrence through implantation of malignant cells from the original growth at operation. If radium destroyed massive recurrences some time after operation, a fortiori, radium applied just after the operation would destroy the individual cells from which recurrences grew. Deep X rays were probably as effective for this purpose as radium, which was known to destroy massive recurrent growths, and ought therefore to be still more capable of destroying individual cells. Implantation was always a danger, and there were very few cases in which it could be disregarded. A short course of deep X rays should be given to the operation scar in all cases of gastric, intestinal, or pelvic cancer as well as after operations for mammary growths and cancer of the cervical glands. Alternatively, radium tubes could be inserted at the time of operation. On the whole, he was not in favour of pre-operative irradiation for several reasons. It produced a general and local reaction from which the patient must be allowed to recover before operation, which was sometimes thus postponed for an undesirable length of time, allowing extension of the dangerous deep parts of the growth. The operator could not guarantee that the pre-operative irradiation would affect the whole growth, and deep microscopical extensions of it might progress during the interval. Even with modern high voltage X rays it was difficult to give a sufficiently intense deep dose to kill carcinoma cells without damage to the patient's tissues. X rays would often cause the primary growth to regress and become mobile but, as Mr. Handley showed by several slides, individual cells from the growing edge would still continue to reproduce. Intensive deep therapy hindered the surgeon by lowering the patient's vitality. Moreover, X rays were used to better advantage after the operation because they had not then to penetrate a thick mass of mammary tissue in order to meet the deeper layers such as the intercostal muscles and the pleura. Before operation, even deep X rays would not deal adequately with the internal mammary and apical axillary glands. The internal mammary glands should be treated at operation by interstitial radium and the apical glands should be removed. He agreed that it was impossible to make a trustworthy estimate by statistics of the relative merits of pre-operative and post-operative irradiation. The best hope for progress in treatment lay in public education to the vital necessity of prompt treatment of suspicious lumps, in closer study by radiologists and surgeons of the details of dissemination, and in the adoption, practically as a routine after carcinoma operations, of a short prophylactic course of X rays of at least 180,000 volts.

Good results had been claimed for surgical or radiological oöphorectomy, but Ahlbom had

concluded that radiation-castration together with local radiation was no better than local radiation alone in 163 cases observed at Radiumhemmet. The only real value of castration was to prevent subsequent pregnancy—a result better achieved by contraceptive methods. Subsequent pregnancy was undoubtedly dangerous; of fifteen cases of pregnancy after carcinoma of the breast, thirteen promptly developed cancer in the remaining breast. Even among radiologists there was division of opinion as to the value of pre-operative radiation. F. E. Adair and F. W. Stewart had tried carefully to assess its value. Thirty-nine patients had been given a radium pack of 4 g. at a skin distance of 6 cm., using four ports, the dose being 20,000 to 44,000 m.c.h. per port. In 28 per cent. the tumour had completely disappeared, and in 13 per cent. no growth had been found in the glands. In 28 per cent. visible cancer had still been present in the breast, and in 73 per cent. in the glands. Forty-two cases had had pre-operative X rays of 200 kv.; the growth in the breast had been destroyed in 16·5 per cent., but the growth in the glands had never been affected. These results did not offer the method much support.

Dr. W. M. LEVITT put the case for a combination of radiation and surgery. In any given series of cases it might be said to be assumed that x cases would be well after five years if treated by surgery and y if treated by X rays. The individuals in either groups would almost certainly differ according to the variation in the factors which made either for radio-sensitivity or for operative success. It was therefore reasonable to suppose that if the two groups of treatment were combined, a more or less complete summation of the successes would be obtained. It had at one time been the common practice in combining the two methods to carry out the radical operation first and regard the X ray therapy as a doubtful safeguard afterwards. Even the radiologist had fallen into the error of being satisfied with a less thorough radiation than he would have given in a case of appreciable disease. Carcinoma cells required a lethal dose, whether the colonies were small or large. Moreover, the X rays had to be distributed over just as wide an area in order to include the whole chest wall and clavicular region on the affected side. Probably owing to under-treatment, post-operative irradiation had not in the past produced spectacular improvement in the published results, although local recurrences had materially decreased. The surgeon was usually in favour of post-operative irradiation; his objections to pre-operative irradiation were those given by Mr. Sampson Handley. The question was whether the irradiation could prevent fresh secondaries and, if so, at what stage in the treatment it was effective. The danger of operating in under a fortnight after irradiation must be offset by the reduction of the danger of implantation and dissemination at the operation. High-voltage therapy could convey an adequate dose to the deeper tissues without injury to the superficial tissues, and would also adequately irradiate internal mammary and apical axillary glands, for the hard rays would easily pass through bone. There was definite experimental evidence, in favour of pre-operative irradiation, that irradiated carcinoma cells were less likely to flourish if implanted into a new site at operation, and also that they were much less likely to take root in irradiated tissues. Moreover, irradiation caused considerable reduction in the areas of growth through damage to the tumour cells. Irradiated cells, though they might survive, often could not reproduce, and this fact might account for the well-known delayed effect of irradiation. Pre-operative irradiation with maximum doses had in many cases led to sepsis and disaster, so that some reduction in the dosage had been necessary, but this deficiency could be made up by a supplementary course of irradiation as soon as the patient had recovered from the operation. The experience of foreign clinics had shown that this method was safe.

The sooner irradiation was given after operation the better, but it was better to wait until the stitches had been removed. The supplementary course should be given two or three weeks after the first post-operative course. No modification was called for in the radical operation, provided that undue tension on the stitches was avoided. The use of the diathermy knife did not appear to increase the risk. Where only post-operative irradiation was being considered the field was unsuitable for interstitial radium, and X rays were more satisfactory than surface radium, for they gave a more uniform dosage over a wide area. Internal structures could be protected by tangential methods of application.

Pre-operative irradiation might be carried out either by interstitial radium or by deep X ray therapy. The X rays probably gave better irradiation of the apex, axilla, and supraclavicular region. Anæsthesia was unnecessary, but the treatment was more tedious than with radium. Irradiation of an inoperable growth by full doses sometimes made it operable, and the radiologist was often asked whether it was then safe to operate. Dr. Levitt held that it was perfectly safe if a complete radical operation was not contemplated. Removal of the breast was valuable after X ray treatment and should be undertaken wherever possible, even if the growth had completely disappeared and the patient appeared to be perfectly well. A breast which had once been the site of carcinoma was always a menace, by whatever means it was treated. These principles of combined therapy applied to the treatment of malignant disease in any part of the body. Dr. Levitt quoted the results of Coutard, Berven, Holthusen and Holfelder, and compared their practice in combined treatment.

Mr. G. F. STEBBING said that he always began treatment of carcinoma of the breast on the assumption that by irradiation alone he would be able to get rid of the tumour, and that the breast should only be excised when it was realised that irradiation by itself would not be successful. If when the patient was first seen the surgeon decided to operate, pre-operative irradiation could be given for a number of purposes. The first was to reduce the size of the tumour by killing the most radiosensitive cells, which were those most likely to lead to metastases. The second purpose was to render the tumour more mobile by reducing the amount of inflammation in the surrounding tissues. A third was to lessen the vitality of all the tumour cells so that any which were sewn on the surface of the wound or squeezed into the lymphatic stream would have less chance of survival. Even a small pre-operative dose was better than none, but it was wiser to give such a dose as would kill off all those cells which could be killed off with the least damage. The best results were obtained by an adequate dose of X rays—in the absence of a radium beam to the breast, axillary and supraclavicular regions. Using 200 kv., some 4500 r should be delivered within three weeks to every part of the patient which was assumed to contain carcinoma cells. Skin reaction would make it necessary to postpone operation for about three weeks, but at the end of that time a radical operation might be

performed. The interval was well spent, and if the tumour and neighbouring lymphatic glands were immobilised and there were no danger of pressure or squeezing, the danger of metastases was very small. The healing of the wound was slower and skin grafting would not take for some two months after the operation. Post-operative irradiation should only be given on the assumption that the operation had left behind tumour cells, and the operator must decide where they were. It should only be employed in the breast region if it was likely to be really effective. Local recurrences could be treated easily and successfully by radium. The axillary and supraclavicular regions should be given a carcinoma-killing dose after every operation for carcinoma of the breast. The term "prophylactic" should be completely abolished, for it tempted to inadequate treatment of an area which should be left alone until disease was present.

Dr. J. R. K. PATERSON said that there were only two main possibilities to which importance should be attached. The radiation should act on sufficiently responsive growths in such a way as to produce lethal change either in the tumour before removal or in isolated fascia or cells of malignant disease after removal. Alternatively, post-operative irradiation should provide a lethal dosage over an area wide of the operative procedure but have no influence on the field of operation itself. Both of these methods depended on the direct effect on the neoplastic cells in the area of irradiation and not upon a systemic effect. Pre-operative irradiation might also devitalise malignant cells so that they would not take root if they were scattered, but this was seldom the explanation of the effect of pre-operative irradiation as ordinarily given. Either before or after operation, irradiation must be given in such doses as were known to produce definite lethal changes in the type of malignant disease under consideration. No difference must be made between irradiation used as a pre-operative or prophylactic treatment and as a direct therapeutic agent. It must therefore be given as intensively as was humanly possible—between 3000 and 6000 r in three to six weeks. Irradiation would only be of value in that type of case in which it had some curative value when used alone. A lesion which was genuinely inoperable when first seen could not be rendered operable by irradiation unless it was at the same time fully cured and required no operation. An already operable lesion might be rendered more operable by clearing up sepsis and lessening growth by shrinkage. Such a growth might appear operable but still be massively infiltrated; the surgeon who found that he could not remove it could not be rescued from the consequences of his misjudgment by his radiological colleague, and the patient was worse off than he would have been if he had been treated as an inoperable case. The general outlook must be that of radical excision and radical irradiation as two distinct methods. Each method must be so thoroughly employed that it achieved in its own right a definite percentage of cures without leaning on the other. The combined method achieved a summation of results rather than of effects.

Miss LOUISA MARTINDALE cited her own figures of 246 cases of cancer of the breast to show the value of post-operative irradiation with X rays. The ten-year survival-rate was higher among the patients who had had glandular involvement than among those who had not; these were the cases in which she had used "adequate" X ray therapy. The earlier cases, in which she had used apparatus which she would now consider inadequate, had seemed to give just as good results, perhaps because she had continued the treatment longer than if she had been using a higher voltage. Later she had found that 156 kv. gave a more successful hardness of rays than higher voltages. Adequate X ray therapy should always be given after every radical amputation; Dr. Martindale supported this assertion by consideration of the statistics of foreign clinics. She had used pre-operative treatment in some cases, but only where the patient had been kept waiting for a bed. She quoted a case of an atrophic scirrhus in the right breast which had received intense and prolonged pre-operative treatment from Prof. Coutard and afterwards undergone a small mastectomy to show how resistant this condition might be. The tissues had seemed to have a subcutaneous œdema and the skin no elasticity; living cells were found in many different areas. It seemed therefore worth performing the radical amputation first wherever possible and following it by steady X ray treatment.

Dr. DOUGLAS WEBSTER quoted Bloodgood's opinion in favour of pre-operative irradiation, saying that this treatment doubled the value of surgery. The value of pre-operative irradiation was most clearly shown in borderline or inoperable cases. If it could do so much in advanced cases it could probably do still more in milder and operable cases. It could add about one-third to the value of post-operative irradiation and was perhaps particularly useful in malignant kidney.

Dr. M. C. BATTEN doubted whether deep X ray therapy would irradiate the far side of a large mass as thoroughly as the near side. Rays from the million-volt tube might do it, though they would probably pass clean through the tissues instead. He advocated removal by efficient surgery, followed by radium or X rays.

Dr. J. E. A. LYNHAM declared that pre-operative irradiation could have no immunising effect on any growth which was not given direct irradiation. He did not agree with Dr. Paterson's surgical conception of post-operative irradiation—a massive dose in a short period. A certain number of cells often survived even in the periphery of the mass, where the intensity of the irradiation should have been greatest. A sublethal dose continued over a period might cause some of the cells to die out, but the patient's tissues had to be considered as well as the growth. Excellent figures had been obtained in the days before high-voltage therapy.

Dr. B. W. WILLIAMS quoted Bloodgood's figures for post-operative irradiation. In two series, one of which received no irradiation and the other post-operative irradiation restricted to prophylactic treatment of the breast area and supraclavicular glands where no secondaries were apparent, the total mortality at the end of three years was identical, and the total recurrences in the irradiated series were slightly greater than in the controls.

SECTION OF ORTHOPÆDICS

AT a meeting of this section held on March 2nd, with Mr. B. WHITCHURCH HOWELL, the president, in the chair, a discussion on the prevention and treatment of

Ununited Fractures

was opened by Mr. A. M. A. MOORE. He said that the problem of the ununited fracture was as serious to-day as it had ever been in the past. He had gone into the records of 65 cases of non-union that had

been treated at three London hospitals in the last ten years; the difficulty had been to obtain accurate records of their early management as 45 of them had been treated at some other hospital and had only presented themselves for final treatment with the non-union established. They had all been in-patients, the fractures were of six or more months' duration, and fractures of the neck of the femur had been excluded from the series, since that problem could be regarded as solved. In the first half of the ten years there had been 29 cases and in the second 36. In spite of the improved methods ununited fractures thus seemed to be more frequent. The Wassermann reaction was positive in 2 of the 39 patients in whom it was performed; the fractures in these were of the clavicle and tibia. No general factors could be established for the causation of non-union. One patient had been radiographed 45 times in 5 weeks, but as the fracture had also clearly been over-extended by skeletal traction, this could not be blamed for the non-union. Radiological evidence of bone infection was found in 19 cases, 14 being in the first half and 5 in the second; 11 had originally been compound fractures and 8 simple. Operations such as plating had been primarily responsible for non-union in 13 out of these 19 cases; the smaller number of infected cases in recent years might be because fewer were now being plated. There were also 20 cases shown by radiography to have been over-extended for a prolonged period during the primary treatment; many others appeared to have been but proof was lacking. The speaker's impression was that while skeletal traction was an extremely valuable method of extension it had been used without due care in many cases recently. A short period of over-extension was probably of great value in reducing deformity, but the weight employed should be considerably decreased as soon as possible. He thought that the 5 cases of fractured phalanges had not been satisfactorily immobilised.

Mr. R. BROOMHEAD said that the diagnosis of non-union was based on movement and pain at the site of fracture when stress was thrown on it, and on sclerosis of the ends of the bone as shown in the radiogram. He discussed the treatment of some kinds of ununited fractures by reconstruction and bone grafting; where shortening was immaterial the ends of the bone could be reshaped and fixed without a graft, but where maintenance of length was essential or removal of scleroaed bone had left a gap grafting was called for. His choice of method of grafting was to use bone chips for spinal grafts, but in ununited fractures of long bones the periosteum, which was essential for success in that operation, was apt to be turned into fibrous tissue. He thought that as large a piece of bone should be used for the graft as was compatible with the mechanical conditions present and that it should be firmly fixed. When there was a gap he performed a sliding inlay graft and filled up the gap with chips; there was, however, the danger that the graft would snap. When non-union was persistent and associated with pain amputation might be advisable. Operation on the humerus was made difficult by the musculospiral nerve; bone grafting of the femur was one of the biggest surgical procedures. All his cases were fixed in plaster for three months and then given remedial treatment.

Mr. H. A. T. FAIRBANK thought delay in union was as common now as it had been twenty years ago. He thought the common causes of delay were local, not general, and that, in addition to imperfect immobility, faulty apposition and poor blood-supply were causes. He had seen the custom of splinting give place to mobility and massage; the two methods seemed to give equally bad results. Many modern cases of delayed union were due to too early massage and movement, others to open operation without adequate screws or proper immobilisation. Malposition was very important; he had been impressed by finding no suspicion of an attempt at union when operating on cases six months after fracture, and yet when put in apposition and plated for immobility the ends had united without delay. He agreed with Mr. Moore that over-extension was a real risk and felt that students should not leave hospital with the idea that skeletal traction was the routine method of treatment although it was the best for fractures of the lower end of the tibia and fibula. Callus formation and the amount of ischæmia might be important but the position was the deciding factor in choosing a course of action. He preferred to operate before delayed union had passed into non-union; grafting was commonly the best treatment, although an intermedullary peg was very useful for the humerus and femur. He too feared the graft would snap. Living autogenous grafts had advantages over all others. It was a mistake to try to correct completely the deformity of fractured ulnar and radius. Circular bands of wire were undesirable because of the risk of making weak spots in the bone.

Mr. G. R. GIRDLESTONE said he believed the principal factor turning delay into non-union was impatience. A patient of his had had part of the upper end of the tibia excised and a piece of fibula put in the gap together with chips. He did not know whether the fibula or the chips had been responsible, but he could believe in both so long as the case had adequate after-care. Many cases would unite if the ends were freshened and brought together. He had believed that grafting provided a certain number of cells and some scaffolding, but in one difficult case in particular it had failed. He had come to accept as a rule for cases of non-union one that applied to amputation stumps—one should not be fussy; repeated operations were to be avoided. The patient should be put up in an ambulatory splint and told to go away for 6 to 9 months. Bone developed some lack of response if repeatedly traumatised, and in that way differed from carpenters' material. The three essentials were immobility without circumferential pressure, intermittent end-to-end compression, and a good blood-supply. The failures, apart from sepsis, came from poor blood-supply, and that was where drilling and opening up of sclerosed tissue played an important part. He made a point of never raising the ends of the bones from their beds; for that meant that only one side could be approached at a time and two operations were sometimes necessary instead of one. He had dealt with 9 cases of non-union in the last five or six years and had had one failure.

Mr. K. H. PRIDIE pointed out that in the radiograms of femurs shown the fracture had in several instances been transverse; there was an inverse ratio between area of fracture section and the time taken in consolidation, but most people confused the terms united and consolidated. He had only had one failure in union in 4000 cases. Long bones, if healthy, readily united after fracture, and non-union was due to treatment; the commonest cause was over-traction, and after that inadequate immobilisation, which had stopped before there was consolidation, or when a plate kept the bone ends apart. After comminuted fracture of the tibia with loss of bone,

the fibula might unite early and separate the two ends of the tibia; the fibula should then be divided to allow the fragments to come into apposition. To prevent non-union, fractures should not be left to house surgeons to treat; traction should only be used to reduce the fracture; once achieved, the traction should be stopped and immobilisation be obtained by plaster for knee and arm fractures by fixed traction for thighs. Skeletal traction should only be used for compound fractures; it was difficult to overpull with strapping extension. Compound fractures should be treated efficiently, converting them into simple closed ones. Fractures should be immobilised with function until there was consolidation. Treatment of non-union consisted of removing plates and foreign bodies. If the bones had become sclerosed and indolent, multiple drilling would reactivate the ends; this could be performed through a tenotomy incision. Where there was a large gap the fracture should be exposed and a rotary saw used up and down the fracture site as well as drilling.

Mr. D. McCRAE AITKEN thought the causes of non-union were movement, compression, and lack of apposition.—Mr. E. I. LLOYD said that the patient should be walking as soon as possible. He considered that union was liable to take longer than the three months mentioned by some authorities.—Mr. B. H. BURNS had not had a happy experience of wire; radiograms had shown definite absorption near it. He was startled by Mr. Fairbank's suggestion of steel plates; when union had occurred in his cases it had done so at the point furthest away from the plate.

Mr. N. ST. J. G. D. BUXTON had seen 24 cases of non-union of the tibia in 8 years; two were congenital fractures; neither had united and one had been amputated; two in middle-aged women had joined and 20 had had osteotomy performed on the fibula, both broken ends of the tibia being freed and cleaned and a bone graft was brought down. This, he considered, was the operation of choice; it allowed angulation to be corrected at the same time.

Dr. J. DUNCAN WHITE thought complete immobility was essential for obtaining union. Even the 45 radiograms taken in five weeks mentioned by Mr. Moore was not likely to be an overdose for the patient.

The PRESIDENT said that he had found non-union to be due in several cases to interposition of fibrous tissue. Massive wide bone grafts with stripping up of the periosteum and freeing of the ends of the bone gave, he thought, the best results. He had recently been using a deeper and wider saw. The messier the operation the sooner union was obtained and the better the result. He believed that metal had to be used sometimes, for instance, to save a limb with a compound fracture.

Mr. BROOMHEAD, in conclusion, said that he used rustless steel wire, but where a plate was also used the wire and plate should be of the same metal. He agreed that skeletal traction was used too much. He had noticed that particularly tall people and those with multiple fractures were more liable to non-union; he wondered whether there were some substance which influenced bony union and which expended itself in tallness and many fractures. Mention had been made of the increase of ununited fractures recently, but of course there had also been more fractures altogether.

MEDICAL SOCIETY OF LONDON

AT a meeting of this society held on March 8th, under the chairmanship of Mr. W. E. TANNER, a discussion on

Effects of Prolonged Dorsal Decubitus

was introduced by Mr. G. R. GIRDLESTONE. He said that, apart from renal stone, the effects of prolonged dorsal decubitus were too indefinite to reach any index system of hospital record. He had had to rely on the investigation of a small group of cases, on his clinical experience, and on the response to a questionnaire of a number of colleagues. The effect on general health differed as between children and adults, and in closed wards as opposed to open-air wards, where part of the body was exposed to the sun or to sky and wind for suitable periods every day. The child in an open-air ward in an orthopædic hospital was in better health than a middle-class child in school or home. Adults did not tolerate prolonged dorsal decubitus well, and were less benefited than children by heliotherapy. Adults usually stagnated after a time, especially if they were splinted. The freer the body from control, the more could the patient respond to the stimulus of the open air. Opinions differed as to whether the shape of the thorax was altered by the decubitus; two doctors mentioned some antero-posterior flattening, which should be countered by exercises and by the adoption of the ventral position. Twenty cases taken at random, all discharged for more than a year, after periods of from one to eight years in a position of decubitus, showed no abnormality in chest shape. On vital capacity he had not been able to get more information than a general impression that it was not altered by prolonged decubitus. Deformities in lower limbs was very much a matter of control, partly by splintage and partly by nursing care. Inadequate nursing might lead to clawing of the toes, genu recurvatum, genu valgum, and so forth, and possibly fixation of a joint in a deformed position. Pyæmic arthritis of the hip might progress to pathological dislocation in an insidious way. In his orthopædic hospital the feet and ankles were, as far as possible, left free in cases of spinal and hip disease, and they were given frequent periodical exercises, controlled by the nursing staff. Of 20 hospital patients recently examined, who had been in do sal decubitus more than a year, 10 had slight pes cavus; of 20 who had been out of the hospital for some time, only 1 had cavus deformity, and that only slight. A few patients developed subastragaloid valgus of the foot, the tendency of which was to cause flat-foot, but that was prevented by weighting the heel when the patient got up. Splints devised to prevent deformity could, if misapplied, cause deformity. Lordosis could be brought about by unrecognised flexion deformity of the hip, and it was almost impossible to correct this by passive movements. Usually scoliosis had an organic cause; that resulting from infantile paralysis came on rapidly, and the deformity might catch one unawares.

In open-air wards the blood picture tended to become normal and in many cases that meant improvement. Decubitus seemed to have no detrimental effect on the blood, but patients lying on their backs for a long time seemed more sensitive than others to shock after a prolonged operation. Mr. Girdlestone's observations lent no credence to the idea that prolonged decubitus lowered the blood pressure. Neither he nor his colleagues

had noticed any abnormality in kidney function as a result of posture alone; but dorsal decubitus predisposed to renal calculi. Here there were two factors at work: posture and infection. When stagnation coincided with concentration of the urine, precipitation was likely to occur. Care about the intake of fluids and dehydration was needed, and a frame should be used for rotating the patient many times a day to aid the flow of urine from the pelvis of the kidney, in the gravitational direction. In 180 beds in his hospital perhaps 100 patients were in a position of dorsal decubitus; and in the last 10 years there had been only 8 cases of stone. In the last 5 years, during which specific measures of prevention had been operative, only 1 patient had developed stone. Early diagnosis of renal stone was very important, as treatment by copious fluids and frequent rotation seemed often to cause its disappearance. Renal stone had been attributed to a diet with deficient vitamin A and excess of vitamin D.

Bed-sores were now very rare in orthopædic hospitals, since the nursing staff understood the use of the frame, the plaster bed, and so forth. In the last few years only one case of persistent bed-sores had occurred in his hospital, in a schoolboy with paraplegia following a spinal fracture. Lastly, Mr. Girdlestone spoke of the effect on the mind of prolonged dorsal decubitus; this could be partly averted by cheerful lighting, the provision of games, and the promotion of good cheer.

DISCUSSION

Mr. JENNER VERRALL said that the orthopædic surgeon tended to concentrate on the particular deformity, and might not notice the other features.

Mr. JOHN EVERIDGE said that, as consulting urologist to the Carshalton Orthopædic Hospital, he had observed many cases of renal calculi associated with dorsal decubitus. In the war attacks of hæmaturia had occurred with stone formation in many patients after prolonged recumbency due to injury. In most of them urinary sepsis was present, and the most common organism was *B. coli*, though there were cases of *B. proteus* and streptococci; staphylococci were not as common as was expected. Hæmaturia with or without urinary sepsis was prone to occur in children who were kept on their backs; in girls it was difficult to avoid contamination following defæcation, the infection being an ascending one by way of the urethra. Stagnation caused by gravity must be a factor in the causation. In cases treated in the Trendelenburg position there was a tendency for stones to form in the high calyx; those children were never thirsty and it was difficult to get them to drink enough. They tended to become constipated, and the aperients given were sometimes too drastic, for violent action of the bowels promoted coli infection of the urinary tract. Disordered calcium metabolism was probably a factor, but in these children it was difficult to demonstrate hypercalcæmia.

Since heliotherapy led to perspiration and the loss of body fluid, these children were kept in the shade as much as possible. Many of the stones were painless, since they caused no obstruction. The prognosis was serious, but not so bad as might be thought. Often calculi, huge judging by the radiographic shadows, disappeared; these shadows were presumably not due to formed calculi, but to the silting up of what was called "mud," which disappeared when the patient resumed normal life. Formed stones also had been observed to disappear to some extent. These children were liable to sharp attacks of ureteric colic with great dilatation of the ureter due to secondary impaction of a stone. The methods at the Carshalton hospital had definitely lowered the incidence of stone. Most of the stones were mixed: ammonium, urate, phosphate, magnesium.

Mr. G. B. WOODD WALKER thought it unlikely that gravity could make much difference to the emptying of the pelvis of the kidney. Recently a film was exhibited at the Royal Society of Medicine showing great activity of the pelvis of the kidney and the ureter. Man and animals could swallow "uphill," and he did not see why urine should not be passed, whatever the position or posture of the kidney. There was little evidence to support the idea that the upright position in man made any difference to the draining of the kidney. He agreed that there must be great stagnation in these patients, and decalcification must be an important feature.

Dr. G. E. VILVANDRÉ remarked that in osteitis fibrosa there occurred a vast decalcification. He had seen the formation of calculi in cases of Paget's disease which were sent for an X ray examination because of urinary symptoms. In some of these he had seen not only calculi in the bladder but also evidences of Paget's disease. Decalcification could result from mere disuse. He had been interested to hear that calculi could disappear more or less spontaneously. Some elderly patients might give the impression, judging by the radiogram, that they had Paget's disease, but further investigation showed this was not so, as there was no bone softening, nor enlargement at the epiphyses; it was simply decalcification due to old age.

Mr. B. WHITCHURCH HOWELL said he had a shock in 1920 when a young patient with double dislocation of the hip-joint had developed hæmaturia a few weeks after commencing a course of reduction by treatment on her back. She developed renal calculi in both kidneys. He worked out, for the patient, a pelvic rest arrangement which kept her in the required position on a hinged support, which enabled gravity to act and the urine to be secreted downwards. Since he had been using that apparatus he had had no further cases of renal calculi and hæmaturia. In the old days patients were kept on their back so long that cardiac efficiency diminished, and probably blood pressure was reduced. Patients kept in an apparatus with a flexion of 30° had no cardiac inefficiency but increased respiratory movement, and they could pass urine naturally and in larger quantity. Many cases were now treated with the Bradford frame. This he had incorporated into a four-poster bed, and by its means a case of spinal caries could be turned through a quarter circle, so enabling the sun to play on the back or on the chest at will. These patients should have definite limb exercises supervised by the nurse, and much fluid to combat constipation. While making the X ray examination of the hip condition it was not unusual to find hard fæces in the pelvic picture. Psychologically, these patients had much to contend with. Recently their lot had been much improved by providing them with prismatic spectacles. An arrangement of mirrors would enable them to appreciate cinema pictures without getting into strained positions. The colour scheme of these wards should be made more restful with more mauve and subdued colouring. Very few of the occupants of orthopædic beds were supplied with proper tinted glasses.

Mr. A. SIMPSON-SMITH said he had treated a girl, aged 18 months, on a Hughes frame at an angle of 75°, and she developed severe bilateral pyelitis and

otitis media, which he and his colleagues attributed to her posture. He agreed with what had been said about decalcification, but he felt that gravity had as much influence in these cases. It seemed impossible that, against gravity, a kidney, by its contractions, could force urine 15 in. into the bladder and keep it there. Even in the decubitus position the kidney was lower than the bladder and the urine would leak back unless there was a very tight fit.

Mr. F. M. LOUGHNANE did not think the decubitus posture had much to do with the formation of stones. For a long time he was at the Hospital for Sea-Bathing at Margate, and he did not remember one patient there developing urinary symptoms or stone in the kidney unless in association with renal tuberculosis. As to the dehydration accompanying exposure to sunlight causing stones, he was in Mesopotamia four years but saw only two patients with urinary calculus. If a kidney could not secrete urine because the patient was on his back, and stagnation occurred, there should be hydronephrosis, and none of the pictures exhibited showed hydronephrosis. When once formed, he did not think a renal calculus would disappear unless passed naturally.

The CHAIRMAN said that in all cases of long-standing infection it was possible for the pelvis of the kidney to be full of urates, which did not show on the radiogram. He had a patient who, in consequence of extensive suppuration of the type seen in the war, had to suffer amputation of the leg just below the hip. His night urine did not exceed 8 oz. and the day urine 12 oz.; probably the kidneys had large uratic deposits in the calyces.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY

A MEETING of this society was held at the West London Hospital on March 5th, under the chairmanship of Mr. NEIL SINCLAIR, when a discussion took place on

Diseases of the Colon

Dr. A. F. HURST discussed the symptoms in organic disease of the colon, especially discomfort and pain, for which the characteristic situation was the left iliac fossa. Any change of the normal bowel habit should be noted as suggestive of disease of the intestines, and more commonly of the colon. It was important to make a rectal examination and to examine the stools. In Dr. Hurst's view there was no such thing as mucous colitis. The mere presence of mucus was not evidence of colitis; it was normally secreted in persons taking aperients, all of which acted as chemical irritants of the bowel. Mucus only indicated inflammation if it was present in a loose stool which was naturally produced, that is, not the result of an aperient. Colitis, Dr. Hurst continued, began exactly like an ordinary dysentery. In this connexion he pleaded for the use of the proctoscope by general practitioners. With regard to carcinoma of the rectum and colon, he believed that nearly all cases originated in polypi. Carcinoma of the colon might produce general ill health with no local symptoms, and this should be borne in mind when any person over 35 complained of general unfitness and nothing abnormal was found on general examination. Occult blood should be looked for in suspicious cases. Pain in the left iliac fossa was often due to diverticulitis; most sufferers from this condition could be treated medically, and it was amazing how a diverticulitis might respond to medical treatment. The medical treatment was rest in bed, a non-residue diet, no aperient, and increasing doses of belladonna; 6 oz. of liquid paraffin might be given as an enema at night.

Prof. G. GREY TURNER, speaking from the surgical side, said that occasionally the inflammatory condition did not remain limited to the bowel, but caused localised peritonitis and a tendency to the development of internal fistulæ. Surgeons were apt in a case of fistula between colon and bladder to attempt too much at a time. If anything had been learned during the last ten or fifteen years it was the extreme importance of dealing with these things in stages. For a communication between the large bowel and the bladder a preliminary colotomy should be the first step, any larger measure only at a second intervention. Diverticuli did not appear to be in any ancestral relationship to malignant disease, though the two conditions occurred in the same types of individuals and at about the same period in life.

Dr. H. W. POST showed a large number of radiograms and discussed the two principal means of examining a patient—namely, (1) a barium meal to estimate the physiological condition of the large bowel, and (2) a barium enema, which showed the anatomical appearance and any pathological changes. Carcinoma of the rectum was rarely diagnosed by means of X ray examination.

Mr. CECIL WAKELEY said that most carcinomas of the cæcum were not diagnosed until the tumour was very large. They did not give rise to obstruction until an enormous growth overlapped the ileocæcal valve. A surgeon was apt on exposing such a tumour to consider it inoperable and to do a palliative ileo-colostomy. But later it would be found that it was no longer fixed, the fixation being due not to the growth but to the superadded sepsis. When after colostomy the irritation disappeared, the growth became more mobile. One of the most important things which had crystallised in surgeons' minds was that in carcinoma of the colon multiple operations had to be done.

Dr. MAURICE SHAW spoke of the condition known as spastic or hypotonic colon, and its treatment by large doses of belladonna. The other principle in treatment depended on recognition of its possible psychogenic origin; treatment must be largely a question of routine. He had watched the treatment of colitis for some 15 years, and to his mind no very significant advance had been made apart from dietetic treatment. It was most important to encourage the patients to take as full a diet as they could. He felt there was some possibility of doing good by protein shock, though he had found no benefit from serum therapy.

Mr. G. F. G. BATCHELOR spoke on the desirability of performing colectomy in the presence of secondary growths in the liver. In one case in which such growths were manifest he had done a colectomy, and for two years the patient was quite comfortable. When the patient returned secondary growths were found in the pouch of Douglas and the liver was not enlarged at all.

Dr. GEOFFREY KONSTAM said that he was always hesitant about diagnosing spastic colon, and nowadays with the accessory methods available some sort of confirmation was desirable. With regard to the use of belladonna, if this treatment were pushed to the extent which Dr. Shaw had suggested it would mean that the patient would not be able to read because of the paralysis of his accommodation,

would not be able to speak because of the dryness of his mouth, and would not be able to eat because of the drying up of the secretions of his stomach.

EDINBURGH OBSTETRICAL SOCIETY

AT a meeting of this society held on Jan. 13th, with Dr. DOUGLAS MILLER, the president, in the chair, a paper on the

Treatment of Placenta Prævia

was communicated by Prof. JAMES HENDRY (Glasgow) and Prof. DUGALD BAIRD (Aberdeen). They began by reviewing the opinions expressed at a meeting of the society in 1925, when the same subject was discussed. Cæsarean section was then thought suitable for a few hospital cases, but vaginal methods of controlling hæmorrhage and effecting delivery were given first place and no reference was made to the importance of making up the patients' blood loss. From consideration of large series of cases there appeared to be a uniform international standard of maternal mortality for placenta prævia in the neighbourhood of 7 per cent.; but limited series had been reported showing a much lower mortality, and the speakers felt that much better results could be obtained. Ninety cases had proved fatal in the Glasgow Royal Maternity Hospital in the period 1925–34, death being due to hæmorrhage in 54 cases and sepsis in 36. Two groups were recognised: (*a*) those reaching hospital in good condition, and (*b*) those arriving in poor condition. The mortality was higher in the latter; it also increased with the degree of placenta prævia. The following recommendations suggested themselves:

(1) If possible, every case of placenta prævia should be dealt with in a maternity hospital or well-equipped nursing-home, but if the patient is already collapsed a blood transfusion should be given in her own home before she is removed, and for this purpose a mobile blood transfusion unit should be organised.

(2) The importance of warning hæmorrhages should be more fully appreciated.

(3) Cases of antepartum hæmorrhage should not be examined vaginally except in circumstances that allow of efficient treatment being carried out at once, and then only by a person qualified to carry out such treatment.

(4) The blood loss must be replaced by blood transfusion.

(5) Cæsarean section should be considered far more frequently, for it offers a very satisfactory form of treatment.

(6) The successful treatment of the placenta prævia requires the coöperation of the general practitioner and the hospital staff.

If due attention were paid to these points a relatively small number of cases need be classified as "unavoidable deaths." During the last six years 228 cases of placenta prævia had been treated in Prof. Hendry's unit with a maternal mortality of 2·7 per cent. Where the placenta did not reach the internal os, and the patient was admitted in good condition, puncture of the membranes was carried out. Occasionally in such a case, if bleeding had ceased and the child was very premature, expectant methods were adopted. Where the prævia was central, or the placenta partially covered or reached down to the edge of the internal os, Cæsarean section was performed in almost every case; expectant treatment was never considered. The proportion of cases treated by Cæsarean section had risen to 64 per cent. during 1936; the more frequent use of this operation had been made possible by blood transfusion, so that women arriving in poor condition could be safely operated on. An efficient blood transfusion service had been established, most of the 200 donors living near the hospital. Vaginal packing had been discontinued, except in grave emergencies. Practitioners were encouraged to send all cases of antepartum hæmorrhage into hospital for diagnosis without themselves making a vaginal examination. If the patient's condition was unsatisfactory a blood transfusion was given before any vaginal examination was made. Version was used in only 8 cases in which the vagina had been packed before admission. A consecutive series of 87 cases of placenta prævia had been dealt with on the lines described during the last two years with only 1 death (a mortality of 1·1 per cent.); this death was due to the giving of incompatible blood. The fœtal mortality-rate in this series was 43 per cent.; where version was used it was 81 per cent.; where the membranes were ruptured it was 32 per cent.; and after Cæsarean section it was 30·2 per cent.

A group of 100 women who had had Cæsarean section performed for placenta prævia more than two years previously were re-examined so as to estimate the end-results. In 90 no abnormality was found and the general health was good. In only 3 symptoms referable to the operation, probably due to adhesions, were present. Of the 100 patients 54 had been sterilised, for many of them were over forty years of age and considered they had large enough families. Among those not sterilised it was calculated there was a sterility-rate of 8·7 per cent. A group of women who had been treated by vaginal methods in the same years as those who had Cæsarean section was also examined as to end-results. Of these, 15 per cent. were found to be in poor health, and the sterility-rate was calculated at 18 per cent.; so the end-results of Cæsarean section compared very favourably with those of the vaginal methods. The risk of subsequent sterility and of rupture of the uterus during pregnancy or labour was much exaggerated.

HÆMOPOIESIS AND THE PITUITARY GLAND.—Prof. I. Snapper of Amsterdam reports a series of five cases in which there appeared to be a direct connexion between disease of the pituitary gland and the functions of the stomach and bone-marrow (*Ned. Tijdschr. Geneesk.* 1937, **81**, 265). In all the patients there were signs of a destructive lesion of the anterior part of the pituitary, associated with hypofunction; in one the X ray picture showed expansion of the sella turcica. Examination of the gastric function revealed complete absence of hydrochloric acid in all the cases. One patient, a man of 52, presented the typical blood picture of pernicious anæmia, to which, after five years, clinical signs of postero-lateral sclerosis of the cord were added. A second patient, a woman, had a hyperchromic blood picture (colour-index 1·27) without other abnormalities and without clinical signs of disease of the spinal cord. In the remaining three patients the blood picture was normal, but examination elicited clear signs of combined sclerosis of the cord. Prof. Snapper points out that the gastric achylia in these patients, with insufficiency of the anterior part of the pituitary, throws a new light upon the cases, of which a few have been reported, of so-called pseudotabes acromegalica (Sternberg). The connexion between the pituitary lesion and the nervous disturbances has never been satisfactorily explained and the gastric achylia appears to furnish the missing link. Why this should be followed in some cases by alterations in the blood picture, in others by spinal disturbances, and in others by both, is not yet explained.

REVIEWS AND NOTICES OF BOOKS

Clinical Heart Disease

By SAMUEL A. LEVINE, M.D., F.A.C.P., Assistant Professor of Medicine, Harvard Medical School; Senior Associate in Medicine, Peter Bent Brigham Hospital. London: W. B. Saunders Co., Ltd 1936. Pp. 445. 24*s*.

IT is not practicable either in general or consulting practice to carry out an exhaustive clinical examination on every patient. Probably the most efficient clinicians are those who exercise best judgment in a selective method of examination. Dr. Levine has borne in mind this principle in his clinical approach to the cardiac problems discussed in this book. He has stressed the importance of bedside methods rather than laborious special investigations in differential diagnosis. The author's style is personal, direct, and unusually readable. Not only has he given full consideration to well-known problems in cardiology, but he has also indicated in what direction further researches need to be planned, and what are the mysteries still awaiting solution. Two interesting points are discussed regarding valvular disease: (1) the frequent association of high blood pressure with mitral stenosis in middle life, and (2) the common coexistence of angina with aortic stenosis; it may be that in each case the individual possesses a vascular vulnerability that exposes him to the risks of inflammatory as well as degenerative forms of cardiovascular disease. Dr. Levine makes concise comments on certain recent advances in cardiological practice, notably the indications for the Delorme operation in constrictive pericarditis, the treatment of chronic cardiac invalidism by thyroid ablation, and the clinical features of pulmonary infarction. The fever and leucocytosis in the last-named condition and the frequent absence of hæmoptysis and electrocardiographic changes are noted and the difficulty that may arise in differential diagnosis from cardiac infarction. The diagnosis and treatment of other acute cardiovascular emergencies also receive attention, and among innumerable matters of practical importance mentioned are bronchial factors in cardiac dyspnœa, the danger of the use of dyes for cholecystography in anginal patients, and the clinical significance of systolic murmurs. Dr. Levine's work is not illustrated except in the terminal section on electrocardiography, but it is well printed and produced.

1. Atlas of Radiographs

Third edition. By A. P. BERTWISTLE, M.B., F.R.C.S. Edin. London: Henry Kimpton. 1936. Pp. 560. 42*s*.

2. Roentgen Interpretation

Fifth edition. By GEORGE W. HOLMES, M.D., Roentgenologist to the Massachusetts General Hospital and Clinical Professor of Roentgenology, Harvard Medical School; and HOWARD E. RUGGLES, M.D., Roentgenologist to the University of California Hospital and Clinical Professor of Roentgenology, University of California Medical School. Same publishers. 1936. Pp. 356. 22*s*. 6*d*.

1. THIS book, which has now reached its third edition, has been compiled, as the author points out, by a clinician for clinicians, and the material selected is naturally not the same as it would be in a work rimarily intended for radiologists. Common condiions are presented rather than rarities. Great stress is aid on silhouette radiograms; probably too much importance is placed on their value. The plan of showing reproductions with a description of the condition on the opposite page is appropriate to a book of this kind, for this method makes it easy for the student or practitioner to follow the different types of lesions described.

Many of the radiograms are of rather poor quality and could with advantage have been replaced by more recent pictures. Unfortunately from the student's point of view, the radiograms are presented indiscriminately, with the left side on the left or on the right. The diagnoses in certain cases would seem open to doubt. For example Fig. 375 is described as an example of Albers Schonberg's (incorrectly spelled Scholenburg's) disease. In this condition the bone is dense. The photograph is more suggestive of normal bone taken at too low a voltage. In Fig. 418 an ulcer is described as bearing radiating processes; without further information, one would be inclined to interpret this as the duodenal-jejunal flexure. In the chest section in Fig. 628 it is said that the bronchial tree is very beautifully seen. The radiating lines seen in the lung fields are now generally regarded as being due to blood-vessels and not bronchi.

It is unfortunate that errors have been allowed to creep in to what is otherwise a useful book. In future editions the quality of the reproductions should be improved, and many of the diagnoses should be re-examined.

2. Diagnostic radiology has become such an enormous subject that the authors in deciding to survey the whole field have found it impossible to give more than very brief consideration to abnormalities. The statements made are, however, reliable and the subject matter is clearly set out. In this edition several sections have been rewritten and many fresh radiograms have been added. The greater part is devoted to the commoner bone and joint diseases, only brief mention being made of the rarer conditions. In the section on heart and great vessels, new methods of measurements are given; the section on lungs and the gastro-intestinal tract has been brought well up to date. Pyelograms have been more widely used to demonstrate lesions of the renal tract. This whole subject has been compressed into twenty pages. The quality of the reproductions is good and the examples chosen are typical. The book should not be regarded as a complete text-book, but it will serve as a useful and reliable introduction to radiology.

Dental Surgery and Pathology

Third edition. By T. W. WIDDOWSON, L.D.S., Dental Surgeon to King's College Hospital; and E. V. B. WIDDOWSON, L.D.S. London: John Bale, Sons and Danielsson Ltd. 1937. Pp. 724. 35*s*.

THIS book began in 1914 as a notebook for students, and now it has expanded into a large work of over 700 pages. It still retains the essential character of a notebook in being a compilation of knowledge from other sources set out as far as possible in tabular form. But a notebook of this bulk seems to miss the mark. It is too big to be a guide or spur to the memory and yet lacks the organic unity of a formal treatise. The student reading this book may collect facts but he will scarcely gain a coherent impression of his subject. As a work of reference, however, this book has a valued place, especially in the libraries of those with sufficient knowledge to winnow out important information from that which is trivial or

obsolete. A special word of praise is due to the chapter on the treatment of irregularities of the teeth by Mr. Russell Marsh, which provides an excellent résumé of the subject.

Chronic Diseases of the Respiratory Tract

Diagnosis and Treatment. By ELMER H. FUNK, M.D., late Clinical Professor of Medicine and Therapeutics, Jefferson Medical College. Revised by BURGESS GORDON, M.D., of the Jefferson Hospital, Philadelphia. London: Humphrey Milford, Oxford University Press. 1937. Pp. 618. 40*s*.

THE revision of Elmer Funk's book was entrusted after his death to Dr. Gordon, who has brought it up to date by the inclusion of recent work on thoracic surgery, pulmonary asbestosis, and so forth. In general the book conforms to the usual pattern both as regards subject matter and arrangement; illustrations, mainly skiagrams, are numerous and well chosen. Therapeutics receive more attention than is customary, the classified description of expectorant drugs and the mode of action of each being particularly useful. In view of this it is surprising to find no more than a passing reference to postural drainage in the treatment of pulmonary abscess. The authors insist clearly on the need for establishing adequate drainage in this condition and advocate bronchoscopic treatment in the acute stage followed, if necessary, by surgical intervention before the walls of the abscess cavity have become rigid.

In the treatment of pulmonary tuberculosis due emphasis is placed on the need to continue bed rest for some time after the cessation of symptoms of activity. In describing the maintenance of artificial pneumothorax the writers pay less attention to radiological control than we do in this country; they consider that "the safest range for intrapleural pressure is from minus 2 to plus 2" and do not appear to be concerned with the marked mediastinal displacement which occurs in certain cases even at these relatively low pressures.

A Preface to Nervous Disease

By STANLEY COBB, A.B., M.D., Bullard Professor of Neuropathology, Harvard Medical School; Psychiatrist-in-Chief, Massachusetts General Hospital. London: Baillière, Tindall and Cox. 1936. Pp. 173. 13*s*. 6*d*.

Prof. Cobb describes his book as "a preface, to start the student with a three dimensional orientation towards neurology and psychiatry—a brief, concurrent anatomy, physiology, and pathology." The early chapters deal with the anatomy and physiology of the autonomic nervous system, the pathways of sensation, and the integration of movement and locomotion. Then follow chapters on functional localisation in the cerebral cortex and consciousness and the "mind-body" problem. After dealing with the anatomy and physiology of the cerebral circulation and the cerebro-spinal fluid Prof. Cobb discusses the general and special histology of the nervous system, and the book ends with a consideration of epilepsy and the psychoses.

The author's long experience as a teacher has enabled him to realise the difficulties of students encountering the complex subject of neurology for the first time, and he has succeeded in packing a surprisingly large volume of useful information into a short book. Like the nervous system itself the book is well integrated. Structure is explained in terms of function, and abnormal physical signs are interpreted as the expression of disordered physiology. The exposition is clear and aided by useful simple diagrams and tables, and the list of references with which each chapter concludes will be of value to those who wish to know more of the subject. In a few details the views expressed are not those generally accepted. Few pathologists will agree that arterio-sclerosis is a cause of intracranial aneurysm, or that paralysis agitans is one of the commonest results of focal arterio-sclerosis. The view that symptomatic herpes is due to a physiological disturbance and not to the herpes virus is nowadays against the weight of the evidence, as is also the statement that epilepsy is rarely inherited as a syndrome without the inheritance of other associated neurological disorders. The attempt to include an introduction to psychiatry has not been altogether successful, for this is too large a subject to be adequately discussed as an addendum to an introduction to neurology. Moreover, in dealing with psychological questions such as the "mind-body" problem Prof. Cobb betrays a bias not uncommon in pathologists, tending to regard a functional disorder as the manifestation of a minute but as yet unknown structural change. But it is only certain details of this kind that are open to criticism. In essentials the author has achieved his purpose, and his book should make a wide appeal to students.

Introduction à la chirurgie genito-urinaire

By Prof. E. E. LAUWERS, Ghent University. Paris: Masson et Cie. 1936. Pp. 197. Frs.32.

Dr. Lauwers has already published introductory works, similarly planned, on the surgery of the nerves, thoracic surgery, and plastic surgery. No better description of the aim of this new volume can be given than that written by Prof. Legueu in the preface: "It is neither a treatise nor a manual for he deals with neither instrumentation nor technique. It is rather a general view of his subject, a bird's-eye view of the pathology of the urinary system, and of the general principles that must be kept in mind in dealing with departures from health." Pascal, in writing to a friend, once remarked that his letter was too long; he had not had the time to shorten it. Dr. Lauwers has given himself the necessary time. He has included in his bird's-eye view not only the whole of genito-urinary surgery, but also conditions that are usually included under other specialties. The book closes with a description of disturbances of menstruation and of sterility. The chief question that rises to our mind after reading it is for whom is it intended? The title suggests that it is meant for the beginner, but the absence of those details on which examiners set such store will be a serious defect in the eyes of the medical student.

Year Book of General Surgery, 1936

Edited by EVARTS A. GRAHAM, A.B., M.D., Professor of Surgery, Washington University School of Medicine. Chicago: Year Book Publishers; London: H. K. Lewis and Co., Ltd. 1936. Pp. 831. 12*s*. 6*d*.

AGAIN the author deserves congratulation upon this useful compilation. The articles are well selected and extracted and cover the whole of general surgery. All surgeons should have this book which makes reference easy and anyhow serves to recall to mind important contributions made during last year. Few active practitioners will not find here accounts of progress which had previously escaped their notice. Altogether an excellent annual.

THE LANCET

LONDON: SATURDAY, MARCH 13, 1937

THE NEED OF A MEDICO-LEGAL INSTITUTE

THE project of a medico-legal institute has now been long enough before the public to breed impatience at the delay in its initiation. A year ago the Departmental Committee on Coroners, presided over by the Master of the Rolls and manned by an impressive proportion of legal members, alluded to the institute as if it were already visible upon the horizon. Envisaging it as a training centre for medico-legal experts and a focus of pathological research, the committee was prepared to accept its diplomas and degrees as a very proper qualification for appointments to an official list of pathologists available for post-mortem examinations in connexion with coroners' inquests. Last June the Advisory Committee on the Scientific Investigation of Crime unanimously recommended the establishment of a national medico-legal institute in London and sketched its scope and functions. The recent republication in the *Medico-Legal and Criminological Review* of Dr. W. G. BARNARD'S paper on the subject, with the comments of Sir BERNARD SPILSBURY, Sir WILLIAM WILLCOX, and others, offers a practical scheme and brings the proposals to a point where decision and action need no longer be delayed.

Three simple questions arise at the outset. How much will the project cost? Where will the institute be placed? And what authorities will be responsible for its management? To cover the capital expenditure on buildings and equipment Dr. BARNARD hoped for a grant from the Central Government, supplemented perhaps by contributions from the London County Council and other interested bodies. Once this initial cost was over, he had an excellent suggestion for meeting the annual cost. The London County Council pays not less than £20,000 a year in fees for post-mortem examinations ordered by metropolitan coroners and for medical evidence given in their costs. The Departmental Committee on Coroners advised higher statutory fees for this purpose in view of the superior attainments for the expert pathologists whom it wished to see employed. If this recommendation received effect, the annual sum would be so much the larger. If the total could be pooled and made available for the proposed medico-legal institute, the annual expenditure could reasonably be met therefrom, and the institute, by providing the expert services required, would quickly justify its existence and embark upon a specific programme which could be afterwards enlarged at discretion. It would be training skilled pathologists for official or other purposes; it would aid alike the cause of general medical education and the essential needs of those who administer justice. The site for such a centre, it has been sensibly suggested, should be near the main buildings of the University of London. If it were possible to locate one of the London coroners' courts under the same roof, there would be educational and other advantages from the association. Dr. BARNARD is probably right, however, in not wishing to see the scheme of a medico-legal institute linked too closely to a municipal system of coroners' courts.

The government of such an institute is an interesting and by no means insoluble problem. The marriage of medicine and law usually leaves one of the pair predominant. Both must have their say. The Bar Council and the Law Society must be persuaded to make their contribution along with the bodies which represent surgery and medicine. The Home Office will be keenly interested and, although a too official atmosphere might not be healthy, the invisible resources of the Privy Council might be called upon in the organisation of the scheme, especially if a Royal Charter be sought. The local authorities of London have their part to play. It is understood that the University of London may not be unwilling to recognise the institute as a teaching school and to create in it a chair of medical jurisprudence. There is a mass of detail to be worked out, but the principle is both acceptable and accepted. The time is ripe. The omens are favourable. Who will take the first step?

ACUTE INTESTINAL OBSTRUCTION

THE fatality of high intestinal obstruction has long been a mystery, for it is obviously not starvation that reduces a previously healthy person or animal to a moribund state in the course of a few days. The ease of the experimental attack, and the importance which would be attached to its solution, have led many investigators to tackle the problem, but none of their theories have really stood the test of time and criticism. For a number of years toxins were thought to be the lethal factors. Then, with the advance of biochemical knowledge, the importance of the loss of extracellular fluids and electrolytes began to be appreciated. The ability of saline infusions to prolong the life of animals with obstruction supported the view that the real cause of death was extracellular dehydration. For a time indeed the riddle seemed to have been answered, but there were always a number of findings that were not explained by a simple loss of extracellular fluids. When histamine was discovered and its pharmacological properties explored, there seemed to be a chance of satisfying the experimental and clinical demands by combining the two theories and naming histamine as the "toxin"; but it soon became evident that this was not to be. A factor was still missing.

It has been known for some years that one of the features of experimental and clinical Addison's disease is a rise in the serum potassium, and the importance of this was much emphasised by the publications of 1936. Attracted by the many common features of Addison's disease and acute

intestinal obstruction, a group of New York investigators [1] performed experiments on cats and are able to show that in these animals high intestinal obstruction is accompanied by a rise in the blood potassium to levels that they regard as lethal. This is a definite advance in knowledge and if the experimental findings are confirmed in other animals, and particularly in man, a real step forward will have been made.

One always hopes that new knowledge will lead to an immediate advance in therapeutics. It must be admitted, however, that unless the administration of the suprarenal extract "cortin" will do the trick, the emergency physician or surgeon is likely to find the lowering of serum potassium almost as difficult as the removal of hypothetical toxins.

AMŒBIC DYSENTERY IN CHICAGO

LIKE pilgrims to the holy city of Benares, eight and a half million people visited the "Century of Progress" exhibition in Chicago during the summer and autumn of 1933. They made epidemiological history, for at a cost of about a hundred lives they proved that amœbic dysentery could occur as an extensive water-borne epidemic in a civilian population. The report on this epidemic now issued [2] is comprehensive and deserves the close attention of epidemiologists and protozoologists. Briefly, the investigations of the board of health and the division of water purification of the city of Chicago and the U.S. Public Health Service appear to have established the following facts. Two hotels, whose water-supply was partly in common, were the source of the outbreak, and two major sanitary defects were found. In one hotel cross-connexions were discovered between a sewer and discharge pipes of condenser-water which, after being used for cooling, was distributed to the hotel and to the upper floors of the second hotel: in certain conditions of overloading of the sewers and heavy rain this water might become polluted by backwash up the pipes. Secondly, in the same hotel, leakage round a rotting wooden plug in an overhead sewer could contaminate a cooled drinking-water tank below.

In the previous eight years 232 cases of amœbic dysentery had been reported to the Chicago board of health. Of these, 8·6 per cent. were subsequently traceable to the two hotels, and an investigation in 1926–27 had shown a carrier-rate of about 5 per cent. in their employees. Of the 1409 cases reported during the 1933 epidemic, 1050 were among guests or employees of these hotels, and during the epidemic itself the incidence of carriers among the employees rose to 37·8 and 47·4 per cent., with a corresponding risk of pollution of the water-supply. As was to be expected from the nature of the disease there was a long latent period—averaging over three months—between exposure to infection and notification of the illness to the Chicago health authorities. The incubation period varied greatly, being most commonly about a fortnight; in a quarter of the cases it was 11 days or less; in a quarter, 12–20; in a third quarter, 21–36; and in the remainder 37–120. The delay in recognising the outbreak was increased by the scattering of the visitors to their homes and difficulties in diagnosing a comparatively rare condition. Not more than 20 per cent. of cases were correctly diagnosed before it became generally known that a large epidemic of amœbic dysentery had occurred, and the absence of the characteristic diarrhœa and of *Entamœba histolytica* in many cases added to the difficulties. An acute onset with fever and abdominal symptoms led to a diagnosis of appendicitis in 16 per cent. of the patients who afterwards died, and the fatality-rate in the 32 cases treated by appendicectomy was 40 per cent. The most common erroneous diagnosis in the fatal cases was malignant disease, usually of the rectum. After a correct diagnosis had been made, the results of specific treatment were very satisfactory: indeed the response to a therapeutic test is of great value in establishing the diagnosis.[3] The chief interest of the outbreak naturally lies in the epidemiological investigations, which were exhaustive. A curious feature was the absence of the enteric fever and diarrhœa usually associated with water-borne epidemics. The explanation suggested is that the chlorine content of the Chicago water-supply suffices to prevent survival of bacteria, but not of cysts. In a later outbreak among firemen at the Chicago stockyards in 1934,[4] in which the water consumed had escaped chlorination, amœbiasis, enteric and gastro-intestinal disorders were all noted. Control of the outbreak was attempted by elimination of carriers of cysts from the food-handling staffs, but there was no evidence that these efforts were successful. However the authors add a caveat "that the experience in this respect is not to be regarded as an indication either of the value or lack of value of the procedure under some other conditions."

By this unique epidemic a new hazard to civil populations has been revealed. The United States of America has led the way in personal hygiene and the careful protection of food and drink, but the Chicago outbreak of amœbic dysentery shows that in the end it is sanitation which counts, and that, as has been consistently taught in this country, an unpolluted water-supply must always be the first line of defence. Although there is less likelihood of any similar outbreak here, carriers are well known to exist,[5] and one lesson to be learnt is that especial sanitary vigilance is needed in connexion with all water-borne diseases at times—e.g., in London at the coming Coronation—when accommodation is strained and weak points in a sanitary system are most likely to be revealed.

[1] Scudder, J., Zwemer, R. L., and Truskowski, R. Their report appears on p. 74 of the first issue of a new monthly journal named *Surgery* edited by Alton Ochsner (New Orleans) and Owen H. Wangensteen (Minneapolis) and published by the C. V. Mosby Company, St. Louis, U.S.A. In this country the subscription price of the journal is 42*s.* per annum, post free (single copies 4*s.*).

[2] Epidemic Amebic Dysentery. The Chicago Outbreak of 1933. National Institute of Health. Bulletin No. 166. U.S. Treasury Department. Washington. 1936. Pp. 187. 20 cents.

[3] McCoy, G. W., and Hardy, A. V. (1937) *J. Amer. med. Ass.* **2**, 1357.

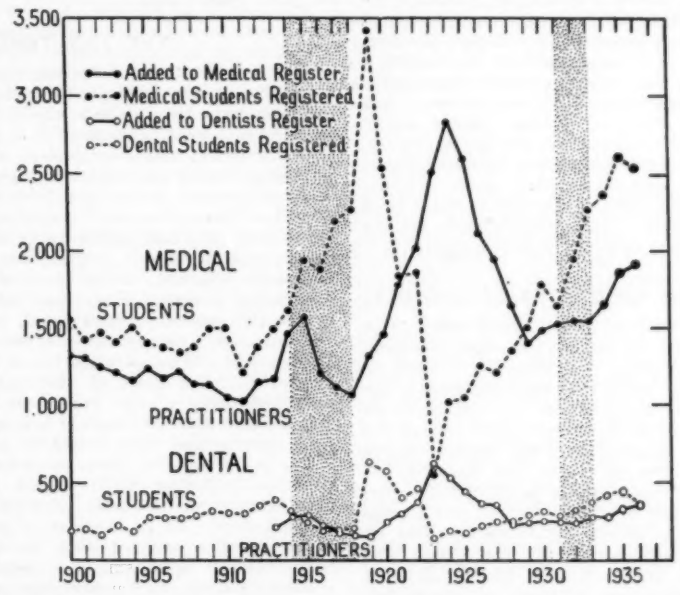
[4] Hardy, A. V., and Spector, B. K. (1935) *Publ. Hlth Rep., Wash.* Reprint No. 1676.

[5] See *Lancet*, 1934, **1**, 46.

ANNOTATIONS

THE TURN OF THE TIDE

THE total entry of students in the medical schools of the United Kingdom and the Irish Free State, as indicated by the numbers registered [1] by the General Medical Council, rose steadily (with one trifling exception) during the years 1923–35. The earlier part of this rise was no doubt the mere rebound of the unparalleled entries of 1919–20, but when the pre-war norm had been reached in 1930 the rise still continued, running closely parallel to the rise in the years 1916–20. The increased entry of 20 years ago was of course related to the war, as is shown on the graph in which the period 1915–18 is indicated by a grey band. Last year Sir Norman Walker remarked that, in the experience of the Council, when trade is bad entries of medical students go up and vice versa. We have accordingly indicated on the graph by a second grey band, as a criterion of trade depression, the three years in which the average level of unemployed males stood above two million, leaving our readers to correlate the two records at their discretion. In 1936 the number of registered medical students was 2544, the decrease of 59 being the resultant of a decrease of 82 in England and 9 in Ireland, counterbalanced by an increase of 32 in the Scottish entry. Scotland had in fact the highest entry recorded since 1919, but it is fair to recall the abnormal flow of foreign medical students to Edinburgh as a result of the troubled situation in Central Europe. The Irish entry which has dropped only by a little during the last two years is still as great as in any year since 1920, bearing testimony to the existence of medical reciprocity between Irish Free State and United Kingdom far more real if less documented than the reciprocity with two foreign states. The numbers added to the Medical Register, depending as they do on the students' entry of five or six years before, are still rising: 1905 last year as compared with 1882 in the previous year, an increase of 23, small compared with the previous increase of 218, and both in England and Scotland the number has fallen appreciably. That brought the number of names on the Medical Register at the last day of 1936 up to a figure of 59,010. The turn of the tide must bring a sense of relief to British medical schools, all of which are, as Dr. Stanley Barnes remarked a short time ago in Birmingham, filled to the limit of capacity. For the first time in the history of the Birmingham school it was found last year impossible to accept some local applicants for places, and Dr. Barnes foresaw a time in the near future when only matriculated students taking a degree course could be accepted at Birmingham. The decrease is not large enough to give immediate relief, nor, in Sir Norman Walker's words, will there be any tendency to lower the standard of entry even if numbers do go down a little. The Dentists Register tells rather a different story: 470 names were added to that register during 1936, an increment of 133, or 40 per cent., on the previous year, and far the highest entry since 1925, when there was still a large influx of practitioners registered under the Dentists Act of 1921. Less satisfactory is the decrease in the number of students starting on a dental career: 356 in 1936 compared with 436 and 422 in the previous years. This is an entry which may well be regarded by the Dental Board as inadequate to replace the probable wastage of the next decade.



[1] The Medical Register for 1937 (21s.); The Medical and Dental Students Register for 1936 (7s. 6d.); The Dentists Register for 1937 (12s.): all published for the General Medical Council by Constable and Co., Ltd.

SUSCEPTIBILITY TO RESPIRATORY INFECTION

IT is the general experience of mankind, and of their medical advisers, that the incidence of colds, coughs, and more serious respiratory infections is by no means random. Some unfortunates seldom survive a winter and early sprihg without repeated attacks, while a happy few appear to be largely immune. Any observations that serve to throw light on these individual variations in susceptibility are welcome, and a series of experiments reported [1] by Dr. A. Locke, from the institute of pathology of the Western Pennsylvania Hospital, offer suggestions that clearly merit further study. A series of rabbits were chilled until their rectal temperature had fallen to 95°–96° F., and a note was made of the time taken to recover 3° in temperature. This was found to vary over a wide range, from about 20 minutes to about 125 minutes. Each rabbit was given a rating assessed by dividing 20 by the time actually taken for this temperature recovery. Thus a rabbit that recovered 3° F. in temperature in 20 minutes was awarded a rating of unity, while one that took 125 minutes was rated as 20/125 (0·16). When an adequate number

[1] Locke, A. (1937) *J. infect. Dis.* **60**, 106.

of rabbits had been rated in this way, one sample of animals were tested by the intravenous injection of a small number of virulent pneumococci, while another sample were subjected to the more severe test of intradermal inoculation. Thirty-six rabbits were injected intravenously. Of these, 12 had been given a rating of over 0·6; 1 died. Of 13 rabbits with a rating of 0·5–0·6, 4 died. Of 11 rabbits with a rating of less than 0·5, all died. Fifty-one rabbits were injected intradermally. Of 16 with a rating over 0·6, 9 died. Of 19 with a rating of 0·5–0·6, 17 died. Of 16 with a rating of less than 0·5, all died. The author then turned his attention to human subjects. Sixty-eight persons—men, women, boys, and girls—were rated by a different method. They were put to work on a machine resembling a stationary bicycle, and their oxygen-consumption per minute, per square metre of body surface, was determined during maximal effort. After rating they were kept under observation for seven months, and the number of colds contracted by each subject was recorded. It was found that those subjects with a high rating developed far fewer colds than those with a low rating. These observations are too few to be decisive, but they are at least suggestive.

SCHISTOSOMIASIS OR BANTI'S SYNDROME?

WE have noted [1] that an illness which seems to be beri-beri may in fact be caused by small intestinal trematodes of the family heterophyidæ. There is now reason, coming from the four continents, for suspecting, in some at least of the instances of Banti's syndrome, an infection by blood trematodes of the genus schistosoma. As Prof. Enrico Greppi has pointed out,[2] Banti's view was that in his syndrome the spleen was fibrotic (a fibroadenia pure and simple is the term used by Greppi), but Greppi himself reported that in the syndrome as seen by him in Southern Italy and Sicily the spleen was certainly not in a state of pure fibrosis since it lessened in size after the injection of adrenaline. He went on to say that E. Bucciante, using in Alexandria on persons with splenomegaly from Mansonian schistosomiasis the same tests as Greppi had used in Italy and Sicily on those diagnosed as Banti's syndrome, had had the same findings. These findings were an increase in the total plasma—held by Greppi to be a hyperplasia, not a temporary hydræmia—which was still present after splenectomy; a real decrease in red cells after making all allowance for the increase in plasma; no evidence of hæmolysis; and splenic contraction after adrenaline. In the *China Medical Journal* for December, 1936, there is a symposium on schistosomiasis, and in it H. E. Campbell says that the pathological reports he got from two different laboratories on enlarged spleens from persons living near Foochow, Fukien, were consistently "Banti's disease." R. C. Robertson urged on him that before accepting this diagnosis he must rule out schistosomiasis, and while Campbell was hesitating to settle this during life by removing a piece of liver when taking away the spleen—in fear that this would add to the risk of an already severe operation—he had a visit from Prof. H. H. Loucks of Peiping, who showed him how it might be done simply and safely. Of portions of 6 livers of those with this condition (4 taken at biopsy and 2 at autopsy) schistosome eggs were seen in 3—a report which should be put beside that of H. B. Day [3] on 5 splenectomies for "Egyptian splenomegaly" during which he made a small liver biopsy, schistosome eggs being present in all of them. Lastly, writing of advanced Mansonian schistosomiasis as seen in Porto Rico, R. M. Saurez and C. M. Gautier [4] say of 10 persons, whose sternal marrow they examined after aspiration, that they had splenomegaly and evidence of liver cirrhosis, and that clinically and hæmatologically their condition was indistinguishable from Banti's syndrome. Clearly before falling back on this obscure diagnosis in the future, the question of schistosomiasis and its probably hopeful treatment will have to be seriously considered.

[1] *Lancet*, 1935, **2**, 1015.
[2] Greppi, E. (1934) *Minerva med., Roma*, Nov. 10th (No. 45).
[3] Day, H. B. (1924) *Trans. R. Soc. trop. Med. Hyg.* **18**, 121.
[4] Saurez, R. M., and Gautier, C. M. (1936) *Bol. Assoc. méd. P. Rico*, No. 12, p. 301.

THE TILT TEST

THE functions of the various organs concerned in equilibration are difficult to understand. Various attempts have been made to elucidate them, of which that devised by J. Tait and W. J. McNally of Montreal, however, and described in a series of papers published during the past ten years, is the study of an experimental animal deprived of the organ concerned. The success they have achieved in unravelling the complicated inter-relationships of the semicircular canals and utricles is largely due to an operative technique whereby, under a dissecting microscope and using a dental drill, they have been able to divide the nerves to each canal, utricle, or saccule without any damage to other structures. Dr. McNally, in a demonstration to the section of otology of the Royal Society of Medicine on March 6th, described some of the results of these researches, and showed films illustrating the methods by which these results had been produced and analysed.

The point of chief importance was the use of the tilt-table in testing the reactions of the labyrinth, with a plea for its more common employment in clinical tests. If an animal minus its utricles is tilted quickly out of the horizontal, an over-compensatory action of the body musculature is produced; and, by further ablations it was shown that the vertical semicircular canals are responsible for this effect. By converse experiments, the utricles were found to act by throwing the body further in the direction of the tilt, thus toning down the reaction of the semicircular canals. Slow tilting affects the utricles only, and the reaction is compensatory. It is not brought into play until some definite movement of the head occurs. Thus slow tilting of the utricles in a certain direction produces the same effect as rapid tilting of the semicircular canals. The two structures are connected in the brain with the same muscle groups, as shown by the similarity of the responses; and by studying the posture and reaction pattern of the muscular reactions in a frog, the exact labyrinthine lesion can be diagnosed. Dr. McNally discussed the phenomena in man of nystagmus, past-pointing, head-turning, and falling, and showed that these movements are really compensatory, similar to the protective movements which resist a sudden tilt. This is seen more clearly by tilting the patient when he is on all fours. The arms then resist the tilt by buttressing. When in the erect posture, the arms resist the tilt by swaying to alter the position of the centre of gravity, much as a tight-rope walker uses his pole, and this movement is away from the direction in which the patient feels he is falling, but in the same direction as the other compensatory reactions such as head-turning. Dr. McNally believes that if more

complete knowledge of the various characteristic reaction patterns of the body musculature on tilting becomes available, the same exact diagnosis of labyrinthine lesions will be obtainable clinically as is now possible in the laboratory. The tilt test is simple, and the reactions elicited by it seem to merit study.

A COMMUNITY TUBERCULOSIS SURVEY

WITH the support of the Norwegian National Association against Tuberculosis, Dr. G. Hertzberg has recently conducted a community survey of two rural parishes in Norway.[1] Thanks to preliminary propaganda and the provision of adequate facilities for expert examinations, he succeeded in netting about 59 per cent. of the whole community, between five and six thousand persons of all ages being tuberculin tested (Pirquet and Mantoux) and the positive reactors being further examined by the sedimentation test as well as radiologically. The radiological examinations consisted of screening and, when its findings were positive or ambiguous, of radiography. A portable radiological outfit enabled Dr. Hertzberg to screen some 200 persons daily at the rate of 30 to 40 per hour, and hustling though this rate was, comparisons of the findings showed that screening was but little inferior in accuracy to radiography. Altogether 120 cases of pulmonary tuberculosis were recognised as such for the first time by this comb-out, and in as many as 90 of these cases the disease was caught at an early stage. It was not a little remarkable that 7 cases of pleurisy with effusion were discovered in persons unconscious of being ill. The cost of this survey worked out at about 7000 kroner, or about 1*s.* 3*d.* per head. It may be noted in passing that such community surveys are at present being conducted systematically in Finland by its National Association against Tuberculosis which has recently equipped itself with 11 portable radiological outfits. Dr. Hertzberg's stimulating and instructive demonstration is likely to be repeated many times in many places.

CEREBRAL ABSCESS

THE treatment of a cerebral abscess is perhaps the hardest task of the neurosurgeon. Accuracy in localisation, good judgment as to the moment for operation, and critical and untiring attention to post-operative details are essentials for success. It is widely accepted that radical operation should be deferred if possible until the acute inflammatory reaction has subsided, and until a firm abscess wall has formed. During this process, however, the intracranial pressure may rise sufficiently to endanger life, and various procedures have been recommended to tide the patient over this period, based on simple paracentesis of the liquefying area of brain. Opinions differ about the correct course to adopt when a well-localised abscess has formed. Total enucleation is practised by some surgeons; others prefer to drain the abscess through a small opening in the skull so as to avoid a fungus cerebri. If the abscess is quite superficial, success usually follows drainage through an adequate opening in the overlying skull; but a much more difficult problem is presented by an abscess lying more deeply in the hemisphere. Operation here carries a grave risk of infection of the superficial healthy brain and of the overlying leptomeninges, whereas with a superficial abscess, the leptomeningeal spaces are obliterated by adhesions before operation is undertaken. For these deeper abscesses E. A. Kahn[1] recommends a modification of the King technique, relying on a two-stage operation to allow the abscess to migrate nearer the surface, and to obliterate the pia-arachnoid spaces by adhesions. The abscess is located by exploring with a blunt needle, without piercing the wall. A wide opening is made in the skull immediately over it and the dura freely incised. Iodoform gauze is packed over the exposed brain and the incision is left open. The second operation is carried out several days later, when the endothermy loop is used to remove the fungus which has formed. The abscess, which will be found flush with the skull, is opened and its cavity packed with gauze. The intracranial pressure gradually extrudes the remains of the abscess and the packing. Three of four cases treated in this manner recovered; Kahn reports these cases in detail, which makes his paper the more interesting.

VENEREAL DISEASES AND MARRIAGE

IMPROVED means of recognising latent venereal infections have served rather to expose past deficiencies than to simplify the standards by which the cure may be determined. The difficulties are such that the most careful investigation does not remove all uncertainty, and the subsequent marriage of the infected patient is never without risk to the marital partner. In permitting marriage the physician takes a very serious decision and his natural anxiety is sometimes interpreted by the patient as an admission that the particular disease is incurable. In fact this view is held by many laymen and by some medical men with regard to both syphilis and gonorrhœa. In a review of this difficult and important subject Wolbarst[2] expresses his opinion that there is nothing inherently incurable in these diseases but that they often remain uncured through the fault of the practitioner, of the patient, or of both. For his own patients with syphilis who wish to marry he demands rigid standards which include 2–3 years' continuous combined treatment with the arsphenamines and with bismuth, followed by 1–2 years' close observation with periodic examination, both clinical and serological, to exclude recurrence. Tests of the cerebro-spinal fluid must be negative a year after the cessation of the treatment. Marriage is permitted to the patient with persistently positive serum tests after prolonged and intensive treatment provided there is no clinical evidence of neurosyphilis and tests of the spinal fluid are negative. Wolbarst throws doubt on his own criteria of cure, however, by advising that observation should continue for 4–5 years before procreation is considered. There must be evidence that during this period the infected patient has remained clinically and serologically negative and has not transmitted the disease to the partner in marriage. He advises that the prospective mother should receive antisyphilitic treatment throughout pregnancy, irrespective of which marriage partner was previously syphilitic, and if both man and wife have been infected, he would have them both permanently sterilised, even though treatment may seem to have been fully successful. All patients who have had syphilis are urged to undergo a brief course of treatment once or twice yearly throughout life as an "insurance against recurrence." To exclude latency of gonococcal infection Wolbarst demands searching clinical and bacteriological examination with repeated tests over a period of several

[1] *Norsk Mag. for Laegevidensk.* February, 1937, p. 224.

[1] *J. Amer. med. Ass.*, Jan. 9th, 1937, p. 87.
[2] Wolbarst, A. L. (1936) *Brit. J. ven. Dis.* **12**, 229.

months. The presence of numerous leucocytes in the prostatovesicular fluid is taken as evidence of probable infectiousness, but he believes that the most efficient single test is the examination for gonococci of the semen, or prostatovesicular fluid obtained by digital massage, by microscopic and cultural methods. He doubts the value of the complement-fixation test for gonorrhœa in the blood-serum as a test of cure.

While many will not accept these views in their entirety they give a fair indication of the doubts and the hazards that arise. It seems that the most rigid precautions will sometimes result in disastrous transference of infection to innocent persons with resulting loss of health and happiness and possible transmission of infection to the next generation. It is certain that these responsibilities are sometimes too lightly undertaken, and that even the most elementary precautions are often omitted.

THE FACTORIES BILL AND MEDICAL PRACTICE

THE Factories Bill which was introduced by the Home Secretary in the House of Commons on Jan. 29th, and read a second time without a division on Feb. 15th, is still being considered in Standing Committee. We have already dealt in a leading article (Feb. 20th, p. 451) with the vital question of the adolescent in industry. It may now be useful to summarise the changes which the Bill, if it is passed into law in its present form, will make in the work of doctors who are wholly or partially engaged in industry. The position of the whole-time industrial medical officer remains substantially unaltered except that under Section 11 the Secretary of State may make special regulations for the medical supervision (not treatment) of persons employed at a factory in certain circumstances which have caused or appear likely to cause ill health. Temporary arrangements for such supervision may be made without waiting for the inquiry which must precede the issuing of a special order. It is possible that this section will provide the foundation upon which a more efficient medical service for industry may be built.

Again under Section 119 (3) the Secretary of State may authorise a medical practitioner who is employed by the occupier . . . in connexion with the medical supervision of the factory to act as an "examining surgeon." The appointment and conditions of work of this officer are set out. He is to be appointed by the chief inspector (or his district deputy) who also has power to revoke the appointment. Appeal against the appointment or against the revocation of an appointment may be made to the Secretary of State. No practitioner directly or indirectly interested in any firm can act as an examining surgeon for that firm, except that a medical man employed by a firm may be employed as an examining surgeon if he is authorised by the Secretary of State to do so. This proviso raises a point of more than academic interest. The examining surgeon from the terms of his appointment is a subordinate official of the Home Office medical staff. A medical man employed by a firm might lack (in certain circumstances) that measure of independence and freedom which is essential for the proper discharge of judicial or semi-judicial duties. The other duties of the examining surgeon are to make such examinations and reports as the Secretary of State may direct, to make an annual report, and to carry out certain duties under the Compensation Acts. Upon the question of fees the Bill is silent, except that it provides that they shall be paid by the employer and be determined by the Secretary of State (or by agreement between the surgeon and the employer). Most of the criticisms, just and unjust, which have in the past been levelled against the existing certifying factory surgeon's work have been due to his inadequate remuneration. Unless there is improvement in the rate of fees paid for these examinations the other alterations in medical work proposed in the Bill will lose much of their value. Under Section 69 the examining surgeon may be called upon to report on accidents and poisonings in industry. If full use is made of these powers the surgeons will gain an insight into working conditions which otherwise may be denied them. Special examinations of this kind should provide a new source of information about industrial disease and accident.

Section 92 governs procedure for the examination of young persons. Power is to be granted to the surgeon to issue provisional certificates of fitness (up to 21 days); to call for the re-examination of young persons (when necessary); and to request the medical officers of the local education authority to provide confidential reports on the past medical history of young persons in doubtful cases. Inspectors are to have power to order the suspension (subject to re-examination) of any young person who appears to them to be unfit for the particular work which he or she is doing. Moreover power is given to the Secretary of State to prescribe the facilities which must be provided for the carrying out of these examinations. It will be seen that in these respects the Bill marks a real advance upon existing conditions of medical work in industry. It is essential that the provisions designed to protect the examining surgeon both in his appointment and dismissal should be strong enough to preserve that measure of independence which is necessary to his efficiency.

HERMANN KÜMMELL

GERMAN surgery is the poorer for the death on Feb. 21st of Prof. Kümmell, who occupied for many years the chair of surgery at Hamburg. Born in 1852 at Corbach, he qualified in 1875 and in 1883 became associated with the Hamburg-Eppendorf Hospital. After 36 years of service there the Hanseatic city at last made up its mind to have its own university and Kümmell was chosen as the first professor of surgery. His writings cover almost the whole field of surgery and make an impressive list. Although in this country his name is associated mainly with the spinal disease that bears his name, abdominal surgery claimed much of his interest. In 1890, when appendicitis was still known as peri-typhlitis, he was writing about its radical cure. Eight years later he was counting 104 recoveries after appendicectomy, and in 1905 he had an experience of 1000 operations. He wrote largely on genito-urinary surgery, particularly in relation to prostatic enlargement; other subjects he touched ranged from Volkmann's ischæmic contracture to injuries of the thorax and resection of the colon. "Kümmell's disease" is a late sequel of spinal injury characterised by increasing kyphosis and pain referred along the distribution of the spinal nerves. In his original description he attributed these symptoms to disturbance of the local circulation as the result of a rarefying osteitis followed by collapse of the vertebral body. Nowadays most of such cases are regarded as compression fractures of the vertebral bodies, which, in the absence of radiological examination, have remained unsuspected, until pressure has caused a slow collapse of the cancellous bone with compression of the emerging spinal nerves.

Pott's disease is excluded by X ray evidence of intact vertebral discs and by the absence of suppuration. The affected vertebral bodies are typically wedge-shaped. Treatment of Kümmell's disease is directed either to the reduction of the deformity by hyperextension followed by fixation in plaster-of-Paris, or, when that is impracticable, to spinal fusion. Fusion should include one or two vertebræ above and below the lesion; the spinous processes are split and slivers turned up and down to meet slivers from adjacent spines. The articular cartilage is sometimes removed from the intervertebral joints, and the fusion may be strengthened by insertion of tibial grafts.

OBSTETRICS AND THE PREMATURE BABY

PÆDIATRICIANS have been showing a greatly increased interest in the care of the premature baby, and in certain centres, such as Chicago,[1] an intensive campaign has reduced the mortality. C. H. Ingram, however, writing from the department of obstetrics of the Western Pennsylvania Hospital,[2] calls attention to certain facts which suggest that the obstetrician must not feel satisfied because the pædiatrician has now stepped in. He shows that four-fifths of the premature babies die in the first two days of life, and in his opinion feeding and kindred nursing problems, managed now as never before in many institutions, cannot be expected to have much influence on these. He therefore proceeds to analyse various factors causing death in this period. He found that multiple pregnancy has the lowest mortality-rate, spontaneous labour coming next. There is a relatively higher mortality in the small group of babies prematurely born of mothers with some form of toxæmia of pregnancy, while, of course, maternal bleeding yields the highest infant mortality. Turning to the type of delivery, it was found that of 52 forceps cases only 17 died, the lowest mortality for any method and in contrast with the results in 203 spontaneous live births with a loss of 113 babies. Still higher mortalities were found in 23 versions and in 51 breech deliveries. It is concluded from these figures that forceps delivery is the best method for helping the premature baby, and in the toxæmia cases it appears that if the mother's disorder is not quickly controlled and if the baby is apparently viable, its chances of survival are enhanced if labour is induced by simple rupture of the membranes. In prematurity Cæsarean section is emphatically condemned, since a baby under 4 lb. seems to have only a slight chance of survival. Ingram also clearly indicates that the larger the premature infant at birth, the better the prognosis. In another section he discusses the autopsy investigations, which in contrast to the reports of other workers show that only a small proportion of the babies died from cerebral hæmorrhage. Despite this he urges injection of fresh citrated blood intramuscularly to all small babies.

CANCER IN CANADA

How far the increase in the death-rate from cancer is "apparent," how far it is "real," is a question which has been taken up by workers in every country. In Canada a study of the available data was made some years ago by Dr. Madge Macklin, who concluded that in that country cancer had definitely increased.[3] Recently she has made a new study of the statistics and compares the position prevailing in 1933, the last year for which figures are available, with that of 1901.[4] The increase in the crude death-rate is certainly not due only to the increasing age of the population of the country, for comparison of the rates age by age shows that both for males and females there has been a rise in the recorded mortality at every time of life. Better diagnosis may undoubtedly play a part, especially in the older age-groups in which in 1901 nearly three times as many deaths were ascribed to senility as in 1933. As a correction Dr. Macklin tries the effect of considering half the deaths recorded under senility at each date as really due to cancer. With this adjustment the cancer death-rate still shows a considerable increase at all ages up to 75, but at 75 and over the 1933 rate is only half that of 1901. Probably the method overcompensates for the lack of diagnosis in earlier days at these advanced ages. A test that is more usually applied is the comparison of the rates of increase of cancer in visible and invisible sites. For the former Dr. Macklin takes cancer of the mouth, skin, breast, and uterus, for the latter cancer of the stomach, liver, and intestines. Comparison of the rates in 1901 and 1933 shows that the visible has increased, proportionately, considerably more than the invisible. Contrary to results found elsewhere, for Canada it cannot be said that the increase lies mainly in those types which are most difficult to diagnose and in which the greatest improvement in diagnosis is likely to have taken place. Dr. Macklin herself finds the explanation of the rise in the elimination of other causes of death, such as infectious diseases. At ages over 35 there would have been in 1933 nearly 11,000 more deaths from infectious diseases in addition to those actually recorded if the 1901 death-rates had prevailed, and it is this group within the cancer age, saved from dying of other diseases, that causes the increase in the cancer death-rate. As regards causation this seems to leave us much where we were. If the extra cancer deaths to-day are of those persons whose prototypes would also have died of cancer thirty years ago, if they had not been brought to an earlier end by some other disease, then the increase is apparent rather than real in the sense that no new causative factors need be implicated. The causative factors were the same thirty years ago but were not brought to fruition. If, on the other hand, more of those saved from other diseases now die of cancer than would have been the case thirty years ago, then we must look for new causative factors. We have no means of determining which is the true position and so cannot explain this increased death-rate at every age.

[1] *Lancet*, 1936, **2**, 700.
[2] *Amer. J. Obstet. Gynec.* 1937, **7**, 80.
[3] *Amer. J. Cancer*, 1932, **16**, 1193.
[4] *Canad. med. Ass. J.* February, 1937, p. 189.

ROYAL FREE HOSPITAL.—The annual court of governors of the hospital will take place at the hospital on Tuesday next, March 16th, at 3 P.M., Sir Alan Garrett Anderson, G.B.E., M.P., presiding. The Minister of Health, Sir Kingsley Wood, will speak, and the hospital will be open for the inspection of visitors.

CORONATION TOURS.—A series of privileged visits to Royal palaces and other historic buildings has been arranged in aid of King Edward's Hospital Fund for London, and will take place on April 7th, 10th, 21st, and 28th, and on May 19th and 28th. Visits will be paid to St. James's Palace and His Majesty's Chapel Royal; the Admiralty and Foreign Office; Hampton Court Palace and Old Court House; Kensington Palace and Royal Geographical Society; Lambeth Palace; Royal Mint, London Dock, Execution Ground, Toc H Church; Windsor Castle and St. George's Chapel. Further information may be had from the secretary of the Fund at 10, Old Jewry, E.C.2.

PRINCIPLES OF MEDICAL STATISTICS

XI—LIFE TABLES AND SURVIVAL AFTER TREATMENT

In the assessment of the degree of success attending a particular treatment given to patients over a series of years the life table method is sometimes an effective procedure. Before illustrating its application to such data, consideration of the national life tables and the information they contain will be of value. A life table, it must be realised, is only a particular way of expressing the death-rates experienced by some particular population during a chosen period of time. For instance, the last English Life Table, No. 10, is based upon the mortality of the population of England and Wales in the three years 1930–32. It contains six columns as follows :—

English Life Table. No. 10. Males

Age x	l_x	d_x	p_x	q_x	$\mathring{e}_x$
0	100,000	7186	·92814	·07186	58·74
1	92,814	1420	·98470	·01530	62·25
2	91,394	600	·99343	·00657	62·21
3	90,794	400	·99559	·00441	61·62
4	90,394	..	..	..	..
..	..	..	..	..	..
..	..	..	..	..	..
..	..	..	..	..	..
..	..	..	..	..	..
102	3·9	2·1	·46960	·53040	1·32
103	1·8	1·0	·44553	·55447	1·25
104	0·8	0·5	·42115	·57885	1·18

The essence of the table is this: suppose we observed 100,000 infants all born on the same day and dying as they passed through each year of life at the same rate as was experienced at each of those ages by the population of England and Wales in 1930–32, in what gradation would that population disappear? How many would be still left alive at age 25, at age 56, &c.? How many would die between age 20 and age 30? What would be the chance of an individual surviving from age 40 to age 45? What would be the average length of life enjoyed by the 100,000 infants? Such information can be obtained from these different columns. The basis of the table is the value known as q_x, which is the probability, or chance, of dying between age x and age $x+1$, where x can have any value between 0 and the longest observed duration of life. For instance q_{25} is the chance that a person who has reached his twenty-fifth birthday will die before reaching his twenty-sixth birthday. These probabilities, one for each year of age, are calculated from the mortality-rates experienced by the population in 1930–32 (for details of method see Woods and Russell, Medical Statistics). This probability of dying is the ratio of those who fail to survive a particular year of life to those who started that year of life (to take an analogy, if 20 horses start in the Grand National and 5 fail to survive the first round of the course the probability of "dying" on that round is 5/20; 15 horses are left to start on the second round and if 3 fail to survive, the probability of "dying" on the second round is 3/15).

The National Life Table

In Life Table No. 10 the probability of dying in the first year of life is 0·07186, or in other words, according to the infant mortality-rate of 1930–32, 7·186 per cent. of our 100,000 infants will die before they reach their first birthday. The actual number of deaths between age 0 and age 1 will therefore be 7·186 per cent. of 100,000, or 7186. Those who *survive* to age 1 must be 100,000 less 7186=92,814. According to this table, the probability of dying between age 1 and age 2 is 0·01530, or in other words 1·530 per cent. of these 92,814 children aged 1 year old will die before reaching their second birthday. The actual number of deaths between age 1 and age 2 will therefore be 1·530 per cent. of 92,814=1420; those who survive to age 2 must therefore be 92,814 less 1420=91,394. From these q_x values the l_x and d_x columns can thus be easily constructed, l_x showing the number of individuals out of the original 100,000 who are still alive at each age, and d_x giving the number of deaths that take place between each two adjacent ages. p_x is the probability of living from one age to the next. p_x+q_x must equal 1, since the individuals must either live or die in that year of life (to return to our analogy if 5 out of 20 horses do not complete the round, clearly 15 out of 20 do survive the round). p_x, therefore, equals $1-q_x$; for example, of the 91,394 children aged 2, 0·657 per cent. die before reaching age 3, and it follows that 99·343 per cent. must live to be 3 years old. Finally, we have the column headed $\mathring{e}_x$ which is the "expectation of life" at each age. This value is not really an "expectation" at all but is the *average* duration of life lived beyond each age. For example, if we added up all the ages at death of the 100,000 infants and took the average of these durations of life we should reach the figure 58·74 years. If, alternatively, we took the 92,814 infants who had lived to be 1 year old, calculated the *further* duration of life that they enjoyed, and then found the average of those durations, we should reach the figure 62·25 years. At age 102 there are only 3·9 "persons" still surviving, and the average duration of life that they will enjoy after that age is only 1·32 years. The so-called expectation of life is thus only the average length of life experienced after each age. We thus have the complete life table.

To reiterate, it shows how a population would die out if it experienced as it passed through life the same death-rates as were prevailing in England and Wales in 1930–32. It does not follow, therefore, that of 100,000 children born this year in reality only 90,794 will be alive at age 3; if the death-rate is in fact declining below its 1930–32 level, then more than that number will survive, if it is rising less than that number will survive. The life table can show only what would happen under *current conditions of mortality*, but it puts those current conditions in a useful form for various comparative purposes and for estimating such things as life insurance risks (inherent in the questions that were propounded above).

The Measurement of Survival-rates after Treatment

We turn now to the application of the method to groups of patients treated over a period of calendar years whose subsequent after-history is known. Let us suppose that treatment was started in 1931, that patients have been treated in each subsequent

calendar year and have been followed up to the end of 1936 on each yearly anniversary after their treatment was started (none being lost sight of). Of those treated in 1931 we shall know how many died during the first year after treatment, how many died during the second year after treatment, and so on to the fifth year after treatment. Of those treated in 1932 we shall know the subsequent history up to only the fourth year of treatment, in 1933 up to only the third year of treatment, and so on. Our tabulated results will be, let us suppose, as in Table XI.

TABLE XI

Results of Treatment. (*Hypothetical Figures*)

Year of treatment.	No. of patients treated.	Number alive on anniversary of treatment in—				
		1932.	1933.	1934.	1935.	1936.
1931 ..	62	58	51	46	45	42
1932 ..	39	..	36	33	31	28
1933 ..	47	..	..	45	41	38
1934 ..	58	..	..	..	53	48
1935 ..	42	..	..	..	..	40

Calculation of the survival-rates of patients treated in each calendar year becomes somewhat laborious if the number of years is extensive and has also to be based upon rather small numbers. If the fatality-rate is not changing with the passage of time there is no reason why the data should not be amalgamated in life table form. For clarity we can write Table XI in the form given in Table XII.

TABLE XII

Results of Treatment. (*Hypothetical Figures*)

Year of treatment.	No. of patients treated.	Number alive on each anniversary (none lost sight of).				
		1st.	2nd.	3rd.	4th.	5th.
1931 ..	62	58	51	46	45	42
1932 ..	39	36	33	31	28	..
1933 ..	47	45	41	38	..	..
1934 ..	58	53	48	..	..	..
1935 ..	42	40	..	..	..	..

All the patients have been observed for at least one year and their number is 42+58+47+39+62=248. Of these there were alive at the end of that first year of observation 58+36+45+53+40=232. The probability of surviving the first year after treatment is, therefore, 232/248=0·94, or in other words 94 per cent. of these patients survived the first year after treatment. Of the 40 patients who were treated in 1935 and were still surviving a year later, no further history is yet known. (If the year's history is known for some of them these must not be added in, for the history would tend to be complete more often for the dead than for the living, and thus give a bias to the results.) As the exposed to risk of dying during the second year we therefore have the 232 survivors at the end of the first year minus these 40 of whom we know no more—viz., 192. Of these there were alive at the end of the second year of observation 51+33+41+48=173. The probability of surviving throughout the second year is, therefore, 173/192=0·90. Of the 48 patients who were treated in 1934 and were still surviving in 1936, no later history is yet known. As the exposed to risk of dying in the third year we, therefore, have the 173 survivors at the end of the second year minus these 48 of whom we know no more—viz., 125. Of these there were alive at the end of the third year of observation 46+31+38=115. The probability of surviving the third year is, therefore, 115/125=0·92. We know no further history of the 38 patients first treated in 1933 and still surviving on the third anniversary. The number exposed to risk in the fourth year becomes 46+31=77, and of these 45+28=73 are alive at the end of it. The probability of surviving the fourth year is, therefore, 73/77=0·95. Finally during the fifth year we know the history only of those patients who were treated in 1931 and still survived at the end of the fourth year—namely, 45 persons. Of these 42 were alive on the fifth anniversary, so that the probability of surviving the fifth year is 42/45, or 0·93.

CONSTRUCTION OF THE SURVIVORSHIP TABLE

Tabulating these probabilities of surviving each successive year we have the values denoted by p_x in column (2) of Table XIII. The probability of not surviving in each year after treatment, q_x, is immediately obtained by subtracting p_x from 1. The number of patients with which we start the l_x column is immaterial, but 100 or 1000, or some such number is convenient. Starting with 1000 our observed fatality-rate shows that 94 per cent. would survive the first year and 6 per cent. would die during that year. The number alive, l_x, at the end of the first year must, therefore, be 940 and the number of deaths, d_x, during that year must be 60. For these 940 alive on the first anniversary the probability of living another year is 0·90, or in other words there will be 90 per cent. alive at the end of the second year—i.e., 846—while 10 per cent. will die during the second year—i.e., 94. Subsequent entries are derived in the same way. (The order of the columns in the table is immaterial. The order given in Table XIII is the most logical while the table is being constructed because p_x is the value first calculated and the others are built up from it. In the final form the order given in the English Life Table No. 10, of which an extract was previously given, is more usual.)

TABLE XIII

Results of Treatment in Life Table Form

Year after treatment.	Probability of surviving each year.	Probability of dying in each year.	Number alive on each anniversary out of 1000 patients.	Number dying during each year.
x (1)	p_x (2)	q_x (3)	l_x (4)	d_x (5)
0	·94	·06	1000	60
1	·90	·10	940	94
2	·92	·08	846	68
3	·95	·05	778	39
4	·93	·07	739	52
5	..	..	687	..

By this means we have combined all the material we possess for calculating the fatality in each year of observation after treatment, and have found that according to those fatality-rates approximately 69 per cent. of treated patients would be alive at the end of 5 years. If we want the average duration of life so far lived by the patients, it is easily obtained.

687 patients of our imaginary 1000 live the whole 5 years. If we presume that those who died actually lived half a year in the year in which they died (some will have lived less, some more, and we can take, usually without serious error, the average as a half), then 60 lived only half a year after treatment, 94 lived a year and a half, 68 lived two years and a half, 39 lived three years and a half, and 52 lived four years and a half. The average length of after-life is, therefore (so far as the experience extends) $(687 \times 5 + 60 \times 0{\cdot}5 + 94 \times 1{\cdot}5 + 68 \times 2{\cdot}5 + 39 \times 3{\cdot}5 + 52 \times 4{\cdot}5) \div 1000 = 4{\cdot}15$ years.

The percentage alive at different points of time makes a useful form of comparison. For instance of patients with cancer of the cervix treated between 1925 and 1934 we find by summarising some published figures in life table form, roughly the following number of survivors out of 100 in each stage of disease :—

	Stage 1	2	3	4
At end of 5 years ..	86 ..	70 ..	33 ..	11
„ 9 „ ..	78 ..	57 ..	27 ..	0

EXCLUSION OF PATIENTS

If some of the patients have been lost sight of, or have died from causes which we do not wish to include in the calculation (accidents for example), these must be taken out of the exposed to risk at the appropriate time—e.g., an individual lost sight of in the fourth year is included in the exposed to risk for the first three years but must be removed for the fourth year. If he is taken out of the observations from the very beginning the fatality in the first three years is rather overstated, for we have ignored an individual who was exposed to risk in those years and did not, in fact, die. If patients are being lost sight of at different times during the year or dying of excluded causes during the year, it is usual to count each of them as a half in the exposed to risk for that year. In other words they were, on the average, exposed to risk of dying of the treated disease for half a year in that particular year of observation. Clearly if a relatively large number of patients is lost sight of we may be making a serious error in calculating the fatality-rates from the remainder, since those lost sight of may be more, or less, likely to be dead than those who continue under observation. Complete follow-up histories are the desiderata. An excellent example of the application of life table methods to the survival-rates of patients will be found in an analysis of 8766 cases treated at the Brompton Hospital Sanatorium, Frimley, made by Sir Percival Horton Smith-Hartley, R. C. Wingfield, and V. A. Burrows (1935, *Brompton Hosp. Rep.* vol. 4).

Summary

Life tables are convenient methods of comparing the mortality-rates experienced at different times and places. The same methods may be usefully applied to the statistics of patients treated in a particular way and followed up over subsequent years.

A. B. H.

SPECIAL ARTICLES

SOME PRACTICAL ASPECTS OF MEDICINE IN U.S.S.R.

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MUCH has been written, in books and in medical journals, on the State medical service of Soviet Russia. These have made it possible to understand not only the organisation as it exists now, but also the immense difficulties that faced the Government fifteen years ago when there was nothing but an inadequate and primitive medical service disorganised by war and revolution. Our object here is to supplement existing publications by recording observations, mainly on maternity and child welfare, made whilst visiting clinics, institutions, and hospitals in Moscow and Leningrad.

The primary concern of the medical service in the U.S.S.R. is not with hospitals or with diseases and their cures but with the maintenance and improvement of the health of the community. The care of the sick and their disposal to hospital becomes a subsidiary function. In the public mind the emphasis has thus been shifted away from the idea of disease toward that of health, which in itself helps to promote a healthy society.

The medical service of the towns aims at dividing the population into groups of from 40,000 to 100,000 persons, each group in a district being centred around a polyclinic, or prophylactorium. These clinics are responsible for all matters concerning health and disease in their districts, and their functions include maternity and child welfare, health visiting, public health services, and sanitary inspection of houses, shops, and public baths, as well as the care of the sick either in the clinic, or in their homes, or by arranging for their transference to hospitals. Thus under one institution and under the control of one district director and his staff are centralised functions that in London may be divided between the general practitioner, the panel doctor, the consultant, the local medical officer of health, the voluntary hospital, and the medical services of the London County Council.

We visited two such institutions in Moscow. The first is one of eleven large new clinics opened in 1930, each of which is responsible for approximately 100,000 of the population. It is a building that would put to shame most out-patient departments in this country. The staff consists of the director and his assistant whose duties are mainly administrative, general physicians responsible for subsections of the district, specialists in all branches of medicine, and pathologists, together with a full staff of sisters, nurses, health visitors, and sanitary inspectors.

The district served by a clinic is divided into sub-districts of so many streets and housing approximately 2000 people, and each is under the charge of a district medical officer whose duty it is to attend to ambulatory cases at the clinic in the morning and to visit those confined to bed in their homes in the afternoon. A doctor is also available for visiting those needing attention between 9 P.M. and 9 A.M. The district officer has the services of the pathology department at his disposal and refers cases needing special advice or treatment to the appropriate consultant, who either sees the patient at the clinic or visits him in his home.

At his first attendance at the clinic the patient is seen in his turn and is then given an appointment card, the number of which enables him to gauge within half an hour or so at what time he will be seen at his next attendance. This to a large extent obviates a crowded waiting-hall with all its disadvantages. On an average working morning in a clinic handling 1000 or more cases a day there is a constant stream of patients coming and going in the entrance hall but no more than three or four waiting outside each consultation room. Moreover, the clinic is open from 9 A.M. to 9 P.M., which reduces congestion further, so that each doctor sees an average of only five or six new patients, or sixteen old ones, in an hour.

The impression we received was that the organisation exists primarily not only for the health but also for the convenience and comfort of the patients. It is true that the clinic in question has the advantage of modern housing and equipment, but it is one of eleven similar clinics already serving 1¼ million people in Moscow, and others are projected to replace those housed in old buildings ill-adapted to their purpose. By a fortunate chance we strayed into a dilapidated old clinic on the outskirts of Moscow, where by the courtesy of the German-speaking director we were given the opportunity of observing for ourselves that even under adverse conditions an equally high standard of efficiency is being maintained.

Maternity and Child Welfare Service

The antenatal and postnatal maternity services are always considered as one unit and are housed together with the child welfare department, the gynæcological department, and the department for the teaching of contraception. This unit is usually incorporated in a district polyclinic, but may be housed separately, or be attached to an experimental Mother and Child Institute, and in any case each serves a definite district, with no overlapping, and all conform closely to a pattern. In each department of the unit the walls of the waiting-hall and passages are decorated with charts, pictures and models, giving well-conceived educational propaganda on the problems of the department concerned—on such points as the physiology of conception and normal pregnancy, the feeding and clothing of pregnant women and of children, the value of fresh air and exercise.

CONTRACEPTION

The demand for contraceptive advice is said to be small. In connexion with the recent illegalisation of abortion it is of interest to record that according to the doctor at the Moscow polyclinic in the short time since the new laws were passed there has been no increase in the demand for advice on contraception, but there has been an increase in the number of pregnancies. On the other hand, we found that this tendency was already apparent before the laws came into force. For instance, at this clinic, at which are registered over 100,000 persons, the number of abortions dropped from 2247 in 1931 to 1630 in 1934. The number of pregnancies rose from 902 to 1148, while the first attendances at the contraception clinic showed no material change (893 in 1931 and 899 in 1934).

The contraceptive method in favour appears to be a small metal cervical cap which is refitted by the doctor each month. A variety of rubber caps and chemicals are also in use.

PREGNANCY

As everyone must now know, pregnancy in the Soviet Union has ceased to be a social or financial handicap. Every pregnant working woman (and 70 per cent. of the adult female population in Moscow is at work) has 8–12 weeks' leave from work on full pay both before and after the birth of her child. In order to have her doctor's certificate she must in any case attend an antenatal clinic earlier than the seventh month of pregnancy, but a very large proportion of women come to the clinic much earlier.

Antenatal care is conducted on lines similar to those in any London hospital, in addition to which excellent educative propaganda in the form of diagrams, models, and frequent lectures on clothing, diet, exercises, physiology, and care of the infant is carried out. In fact, the educative function of the antenatal clinic is organised on a scale unparalleled in this country. At the antenatal clinic expectant mothers are told at which hospital they will be delivered, and at the onset of labour they present themselves there for admission. There is no organisation in Moscow for the delivery of women in their own homes, and hospitalisation approaches 100 per cent. in all large towns.[1] The largest maternity hospital in Moscow, the Clara Zetkin, of which Prof. Blisnjanska is the director, serves a number of district antenatal clinics, admitting some 6000 maternity cases a year. That the standard of maternity care is at least as high as that in similar institutions in this country is shown by the maternal morbidity and mortality figures, 15·0 and 1·0 per 1000 respectively. The maternal mortality for the whole of Moscow is 2·1 per 1000: that for England was 3·94 per 1000 in 1935.

On admission to hospital the patient is bathed and undergoes a general and obstetrical examination. The pyrexial cases are admitted to a separate septic block, while the apyrexial pass directly to the labour wards of the main hospital. Labour is conducted in two adjacent wards each of ten unscreened beds, patients passing from one to the other at the end of the first stage of labour. Anæsthesia is recommended for primiparæ and for others when so ordered by the obstetricians. A shortage of general anæsthetics has led to the use of a variety of local and basal anæsthetic measures. There is, however, little concession to ideas of modesty or privacy, and no small impression was made on us by the sight of seven unscreened women in the second stage of labour and an eighth in the lithotomy position with a recently expressed placenta in a dish beside her. One can well imagine the feelings of a young primipara in the early pangs of the second stage involuntarily receiving auditory and visual evidence of what the immediate future holds in store for her.[2]

Two hours after delivery the mother is removed to a recovery ward and the baby to a nursery. Postpartum care of the mother proceeds along usual lines and includes daily physical exercises, and on the final day an instructional lecture on the care of herself and her baby. She does not, however, have any personal contact with her child except at feeding-time until she goes home, and has no opportunity of attending to it under supervision. In the absence of complications the women get up on the morning of the eighth day and go home on that afternoon. A curious defect in the organisation is that arrangements for transport are left to the woman's relatives,

[1] Webb, S. and B. (1936) Soviet Communism: A New Civilisation? London. Pp. 820–822.

[2] It is only right to add that similar conditions exist in many maternity hospitals in this country.

with the result that some women do in fact walk home alone with the infant.

CHILD WELFARE

To an English observer it is surprising to find how large a proportion of women successfully feed their infants on the breast. The problem of artificial feeding as we know it in England and America, with its multiplicity of foods and methods, does not exist in the Soviet Union, and the maintenance of lactation gives no difficulty even in the big industrial centres where a large proportion of the women are at work. A mother who "loses her milk" is a rarity, and even supplementary feeding is uncommon before six or seven months. In the Moscow district polyclinic that we visited, which has on its books 6000 children of 0–3 years, only 10 babies under six months of age were being given supplementary feeds, and these, it may well be noted, were of human milk. In another clinic, where 2000 children under one year attended, none under six months were entirely artificially fed, and the director estimated that not more than 5–10 per cent. were receiving supplementary feeds. In Leningrad, Prof. Mendelevar at the Institute for the Protection of Mother and Child, an experimental clinic to which a large number of difficult cases are referred, estimated that 80 per cent. of the babies attending are entirely breast-fed at six months. These figures are astonishing to anyone who has worked in welfare centres in London, and they contrast sharply with figures collected by one of us (A. E. R.) from a number of welfare centres in North London, where of 980 cases examined only 41 per cent. were entirely breast-fed at four months old. It is difficult to find an adequate explanation for this difference between the capabilities of the women of the two countries in respect to what should be a natural physiological function. The general standard of living and nutrition of the Moscow women and the London working classes do not appear to differ sufficiently to account for it. One factor that may play a part is that breast-feeding has always been customary among the Russian peasantry, and industrialisation has fortunately not been allowed as yet to interfere with this natural state of affairs. The medical authorities accept without question the importance, or rather the necessity for breast-feeding, and under every condition of health and social circumstance the mother and her nursling are regarded as one unit. From the day of birth every effort is made to avoid any procedure which may prejudice the success of lactation. The mother has two months away from her work on full pay before and after the confinement. This measure in itself removes any cause for financial and domestic worry. On her return to work the mother takes her infant to the factory or office creche and is released from her work for half an hour every three or four hours to feed it. Again, illness on the part of the mother or child is not allowed to interfere with the process of breast-feeding. At the Clara Zetkin Institute, the professor's assistant told us that they recognise no contra-indication to lactation whatsoever on the part either of the mother or the child.[1] Women with puerperal fever, pneumonia, cardiac disease, and so on still suckle their infants, and only if the mother is severely exhausted is the milk expressed by artificial means and given to the child by bottle. The suppression of milk secretion is considered to be an additional strain on a sick woman.

In the event of the child falling ill the continuation of breast-feeding is still more greatly valued. The mother is regarded as a most valuable ally of the medical attendants. At the Morozov Clinic, a children's hospital in Moscow, out of a total of 700 beds, 100 are set aside for the accommodation of the mothers of infants admitted for medical or surgical treatment, and one of the most vivid and pleasing memories of our visit is that of entering a small ward in this hospital where a baby recently operated on for a hare-lip was asleep in a cot with the mother resting on a bed near to it reading while she waited to attend upon and to feed the child. In Leningrad we found that there is adequate accommodation for the mothers at the clinic during the day, but that they return home at night. The production of a doctor's certificate of sickness of a child, whether at home or in hospital, releases the mother from her work on full pay. Lastly, in the few instances where a woman for one reason or another is unable to breast-feed her baby, a supply of human milk is obtainable from the milk kitchens attached to the welfare centres. Women with an excess of milk or those in process of weaning their own children are encouraged to come up to the milk kitchen departments and to sell their milk; this they are taught to express under supervision and it is then bottled and sterilised. Dried and evaporated milk is scarcely used in the clinics, and there is no dried milk industry as yet established in the U.S.S.R.

Weaning is carried out with cow's milk and a variety of starchy and vegetable additions. This process has led to the organisation of the milk kitchens which are a striking feature of the Soviet welfare centres, and which form a new and valuable contribution to the problem of supplying the children of an industrial population with properly prepared clean milk and other food. These milk kitchens supply one or more district welfare centres, and the output of each is approximately 5000 or more feeding bottles a day. Each kitchen obtains its milk from one farm, usually State-owned, where collection is regulated and where the herds are tuberculin-tested. The milk arrives at the kitchen within a few hours of collection and it is at once cooled, standardised with regard to chemical and bacterial content, and put up and sterilised in sealed bottles either as whole milk, modified or acid milk, or in combination with a large variety of cereal and vegetable products. The bottles are set aside in cooled chambers to await distribution to the mothers, who present daily the formula which they have been given by the doctor, and receive the requisite number of bottles made up according to this prescription and ready for the day's feeds. In this way each feed is contained in a single bottle and the risk of contamination is negligible.

By means of these milk kitchens the diet of a large number of children from six months to three years of age can be controlled and adjusted according to current knowledge of nutritional requirements, and by such an organisation nutritional experiments could be undertaken on an unprecedented scale. On the other hand, any defects in the milk diets put out by the kitchens, whether local defects such as some error in one of many processes before the food reaches the children, or a more general neglect of some principle of infant feeding, will be widely reflected in the standard of health and nutrition of the local or general infant community. Indeed, we consider that one essential principle of infant feeding is being neglected and that a combination of circumstances has led to a fairly widespread iron-deficiency anæmia among the young children (in Moscow at least, where the greater part of these observations

[1] But see section on tuberculosis below.

were made). We use the words iron-deficiency anæmia advisedly, as the state of nutrition of the child population appeared in other ways to be satisfactory, which indeed would be expected as a result of the methods of infant feeding we have described.

The striking and unquestionable pallor of the children under three years of age, in institutions and even in the streets, is a point that, so far as we can discover, has not been commented upon, nor has the question of iron-deficiency anæmia been investigated or recognised. At no hospital, creche, clinic, or even experimental institute would any doctor agree with us when we suggested that some of the children were suffering from this type of anæmia. We were told that anything over 65 per cent. of hæmoglobin is accepted as normal, but it is clear that many of the children fall short of this standard. Our impression was supported by figures shown to us at a creche in Moscow, where of 67 apparently healthy children of one to three years of age the average hæmoglobin level (Sahli) was 50·5 per cent. (lowest 27 per cent., highest 64 per cent.). Four of these children had hæmoglobin levels below 40 per cent.

In this country iron-deficiency anæmia is looked upon as an indication of a state of under-nutrition, and a widespread anæmia amongst the child population of Moscow and Leningrad is at first sight at variance with the indubitable fact that the mothers are so very successful at providing the ideal food for their infants, and that the health authorities apparently provide more complete welfare supervision for the infants than we do in this country. We sought, therefore, to discover some adequate explanation for this apparent paradox by determining at what point the infant population is receiving inadequate supplies of iron.

The infant receives a store of iron during fœtal life that has to last it until it is given some food containing more iron than does human or cow's milk. We have no direct evidence pointing to the existence of anæmia among Russian women, nor could we find that blood analyses have been done on a large scale upon pregnant women. The following points, however, are at least suggestive. Meat has only become at all plentiful during the last year or so. Before 1936 it was often unobtainable at any price. The position with regard to green vegetables is similar but less striking. Certain it is that for the four or five years previous to 1936 the diet of the general population was such that iron-deficiency anæmia was most probably present. Such few figures as we were able to obtain, taken at random from the books of the polyclinic, showed that the average blood count of women attending the clinic for a variety of diseases was: red cells, 4,380,000; hæmoglobin, 69 per cent. (Sahli). We can say, therefore, that in all probability children six months of age at the time of our visit in September, 1936, were born of women who for the past ten or fifteen years have been getting a diet deficient in iron. The methods of weaning practised in Russian clinics also have some bearing on this question. At the District Polyclinic in Moscow children are breast-fed for about seven months, or longer if the child was premature, vitamin additions being given from three months. From seven months rice flour is given with a cow's milk mixture, at eight months fruit juice (grape) is added, and not until ten months is any iron-containing food given. At the Institute for Mother and Child Protection at Moscow meat juice is given at eight months. We were told by a doctor working in a small outlying clinic that of her seven colleagues two were pre-revolutionary in training and kept the babies under their care on breast-milk alone up to twelve or fourteen months. There thus exists, in the low iron store at birth, in the late weaning which is fostered to a great extent by the very success in breast-feeding that we have commented upon, and in the excessive use of cereal foods deficient in iron, such as rice, barley, and fruit juices, a combination of factors predisposing to iron-deficiency anæmia in young children. Furthermore, the facts that even with otherwise adequate food iron in some form is needed by the infant at an early age, and, that anæmia increases susceptibility to infection do not appear to have yet been recognised in the Soviet Union. The director of a Moscow polyclinic, when he agreed that some of the extremely pale children might be suffering from some degree of anæmia, asked whether after all it was of any great consequence. Questions relating to treatment were answered in terms of ultra-violet light, fresh air, good food, extra vitamins, and medicines containing phosphorus and calcium specifically to improve bone growth. More often than not, iron was omitted from the suggested treatment. These facts provide some basis for the criticism which is sometimes levelled at the medical science of the Soviet Union, that during its rapid general advance progress has lagged behind unaccountably in many directions. This is not surprising and is scarcely avoidable since this progress has taken place in circumstances of comparative isolation due partly to the language difficulty and partly to the historical events of the past twenty years.

Tuberculosis

Before the revolution little or nothing was done to deal with the problem of tuberculosis, although it did, and still does, rank highest in the list of fatal diseases. The death-rate per 10,000 in Russia in 1913 was 22 per 10,000. Since 1920, when the death-rate in Moscow from tuberculosis reached the high figure of 39·7 per 10,000, a nation-wide campaign has been fought against the disease, with the result that the figure was lowered to 11·6 per 10,000 in 1931 [4] and 9·7 per 10,000 in 1935. Of recent years this campaign has been intensified, and we think that the efforts made in so far as children are concerned are worthy of a special note.

The milk for general consumption is sold in dairies, and comes by way of the "milk factories" from collective farms, whose herds are not tuberculin-tested, and many of whose cows are therefore presumably infected. At the factory the milk is inspected, pasteurised, and bottled. In addition, a certain amount of raw uninspected milk is sold in the open market by individual peasants. The milk kitchens attached to the district child welfare centres, which supply a very large proportion of the child population up to three years of age in the big towns, receive milk each day from their own State-owned farms. At some of these farms the herds are regularly tuberculin-tested, but this is not done universally. At the milk kitchen the milk is sterilised, as we have already described, in order to prevent the spread of tuberculosis and other bacterial disease amongst the children.

Another feature of the fight against tuberculosis which is apparently unique to the U.S.S.R. is the institution of night sanatoria, to which attention has frequently been drawn.[5 6] To these institutions,

[4] Webb, S. and B. (1936) Soviet Communism: A New Civilisation? London, p. 858.
[5] *Ibid*, p. 856.
[6] Newsholme, A., and Kingsbury, J. A. (1934) Red Medicine. London, p. 247.

which are attached to the regional tuberculosis dispensaries, children with "weak chests" or whose home conditions are particularly bad are sent to spend the night and be provided with two good meals. They go to school as usual during the day. A second group of children come during the day and return to their homes at night. In this way many children, though not ill enough to be sent away, can yet for several months spend half their time under medical supervision in hygienic surroundings and be assured of adequate nourishment. Night sanatoria for adults are run on the same lines.

Lastly, in common with a number of other countries, the U.S.S.R. is using B C G vaccine for the immunisation of infants born of tuberculous parents. Women attending the tuberculosis dispensaries who become pregnant, and those attending district antenatal clinics who are found to have tuberculosis, are carefully supervised at the dispensaries, and provided the disease is quiescent are allowed to come to term normally. When the baby is born, it is given B C G vaccine by mouth before the tenth day, and meanwhile is allowed to feed at the breast. Women with open tuberculosis who become pregnant are either advised to have an abortion or are sent to the Clara Zetkin Maternity Hospital in Moscow. This institute receives all such cases from Moscow and a wide surrounding district. Every woman is there immediately admitted and her condition investigated by a panel of three doctors, consisting of a chest specialist, an obstetrician, and a pediatrician, and the most suitable treatment is devised to suit the case. The woman is then sent to spend the rest of her pregnancy in a sanatorium, returning to the Institute to be delivered. When the child is born it is immediately separated from the mother for the first ten days of its life, while it is immunised by the oral administration of B C G vaccine. Meanwhile lactation is encouraged by artificial means, and the milk fed to the infant. At the end of ten days the child is returned to the mother, and both spend a further period at a sanatorium. During the past few years 1270 women with tuberculosis (95 per cent. with pulmonary tuberculosis, 14·6 per cent. with positive sputum) have been treated in this way and their babies immunised with B C G vaccine. The infantile mortality in the first year of life was 117 per 1000 (as compared with the figure of 120 per 1000 for the whole of Moscow); only two children died of tuberculosis, one not having been immunised.[7]

The authorities in Moscow claim that the results of this experiment are already encouraging, as is indicated by the figures above which were given to us by the director of the Institute, and it is intended shortly to extend this immunisation to cover all infants born, irrespective of the state of health of the parents. By this procedure it is hoped eventually to reduce the incidence of tuberculosis among young children to negligible proportions.

Medical science in the Soviet Union has produced much that is admirable both in theory and in practice. The most noteworthy and characteristic achievement has been a fundamental change of viewpoint from a preoccupation with the study of disease to a realisation of the far greater importance of the maintenance and improvement of health. The outcome of this realisation has been the establishment of a national medical service which is designed to deal with all aspects of the health of the community and in which emphasis is laid on preventive measures. In the large towns, and in those departments of medical science with which we are familiar, this service appeared in practice to be satisfactory both to the individual and to the State. An immediate advantage of such an organisation is that health measures approved of in principle can be rapidly put into effect over a large proportion of the population. The scope for research on a national scale appears to be almost unlimited, and it is going forward in many branches of medicine.

It is of great interest to the visitor to study the advantages and disadvantages of a State health service developed on logical lines on such a comprehensive scale, and we are grateful to the many doctors and officials whose kindness and patience helped us to follow the working of this medical service, of which the Soviet Union is justifiably proud.

[7] Blisnjanska, A. I., Lasarevitsch, A. I., and Triousse, M. W. (1935) *Gynéc. et Obstét.* **32**, 505.

INTERNATIONAL BIOLOGICAL STANDARDS

On a previous occasion[1] we gave an account of the history and development of the work of the Permanent Commission on Biological Standardisation of the Health Organisation of the League of Nations. The current number of the Quarterly Bulletin[2] records the progress made during the past two years, during which time standards for three of the sex hormones, for gas-gangrene antitoxin (histolyticus), and for diphtheria antitoxin for use in the flocculation test have been adopted. During the period it has been necessary to make certain changes in regard to some of the standards which have been in use for many years.

Insulin

Partly on account of the fact that the original insulin standard established in 1925 is now exhausted and partly because that standard has become progressively less suitable for the assay of the increasingly pure insulins of commerce, a new international standard for insulin has been provided by the Commission. The standardisation of this important remedy, the safe and effective application of which depends so much upon accurate dosage, was put upon secure foundations in 1925 by the adoption of an international standard and the definition of a unit. The original standard was prepared from the purest insulin available at the time, and for many years it served its purpose. With the advent of the highly purified insulins of commerce, however, it was observed that small but definite differences in potency were assigned to pure preparations according as to whether the assays were carried out by the use of rabbits or of mice, when the comparison was made directly with the relatively impure standard. The reason for these discrepancies is not at present fully known, but the fact that they occur and, moreover, the fact that samples of pure crystalline insulin have activities which are indistinguishable by whatever method they are assayed, led to the decision to adopt, as the new international standard, a preparation of the purest insulin obtainable; 51 grammes of such a highly purified insulin was prepared by Dr. D. A. Scott of the Connaught Laboratories, Toronto, and, through the generosity of the insulin committee of

[1] *Lancet*, 1935, **1**, 685.

[2] *Quart. Bull. Hlth Org. L.o.N.*, Biological Standardisation, Spec. No., November, 1936.

the University of Toronto, was placed at the disposal of the Commission with a view to its adoption as the new international insulin standard. The next problem was to assay the new standard in terms of the original one—in effect, to determine the weight which had the same activity as one-eighth of a milligramme of the original standard which, since 1925, had represented the unit of insulin activity. Comparative tests were carried out by three independent investigators in Canada, three in England, one in Denmark, and one in the United States of America. The discrepancies already referred to were again revealed in the evaluation of the new standard in terms of the old; using the rabbit as the test animal, the average value of the new standard was 21·5 units per milligramme, while the average value by the mouse convulsion method was about 25 units per milligramme. The results of the determinations of the experts were subjected to critical examination by a small conference consisting of Sir Henry Dale, Prof. C. H. Best, and Prof. A. Krogh. They gave reasons why it was not possible to decide upon the unit value of the new standard solely on the basis of the values returned; but, taking into consideration all the data and available information, and the views of the individual members of the conference, the Commission decided to accept the new standard for international use and redefined the unit of insulin as the specific insulin activity of one twenty-second of a milligramme of the new standard. It is stated that no appreciable change, or at most a fractional change in the direction of a slight increase, in the value of the unit is involved in the decision now taken. Further, it is pointed out that the difficulties which have been encountered in the present inquiry are unlikely to recur; that the value now accepted for the unit of insulin, in terms of the new standard, is likely to be final and permanent and not subject to further uncertainty or possibility of even a fractional change if replacement again becomes necessary; and that the standard itself, being a pure crystalline substance, is susceptible to periodical control in comparison with new samples of freshly prepared insulin.

Digitalis

The original international standard digitalis powder, established in 1926, now being practically exhausted, a new standard preparation has been adopted by the Commission. Replacement in this case has been relatively simple. In 1928 a large quantity of dry powdered digitalis leaves was prepared in England, accurately assayed in terms of the international standard, and adopted as the British standard digitalis for use in connexion with the British Pharmacopœia. Recent comparative tests have confirmed the earlier evaluation of the potency of the British standard, and, an assurance having been obtained of its stability and suitability for use, the Commission decided to adopt the British standard preparation as the new international digitalis standard. Adequate quantities of the preparation have been placed at the disposal of the Commission by the National Institute for Medical Research, Hampstead, where it is maintained for international distribution.

Posterior Lobe Pituitary

In 1925 an international standard for posterior lobe pituitary was established, and a small quantity of standard powder was available for the assay of national standards. No laboratory, however, has hitherto been officially entrusted with the care and distribution of the posterior lobe pituitary standard. In England a quantity of dry posterior lobe pituitary powder, equal in activity to the small sample referred to above, has been in use as a national standard since 1925. Moreover, since the National Institute for Medical Research has, for many years, distributed this standard to workers in many countries, the Commission decided to adopt, as the international standard of pituitary extract, the posterior lobe pituitary powder prepared at this institute, and to request it to hold and distribute the standard on behalf of the Health Organisation. The Commission took the further step of defining a unit of antidiuretic activity in terms of the international standard. The position has now been reached, therefore, that the standard maintained at Hampstead is now officially adopted as the international standard for the assay of the active principles of the posterior lobe of the pituitary, and the unit of oxytocic, pressor, and antidiuretic activity respectively are defined in terms of this preparation. It is pointed out that when the present standard has to be replaced it will be necessary to make a fresh determination of the relation in which the oxytocic, pressor, and antidiuretic actions stand to each other and, if necessary, to redefine the units in terms of which those three actions are expressed.

Arsphenamine

In 1925 international standards for six arsphenamine (arsenobenzene) derivatives were established and, until recently, all of these except sulpharsphenamine were maintained at Frankfurt for international distribution. Circumstances have arisen which necessitate a new arrangement whereby these standards can be made available for international use, and the Commission has accordingly entrusted the National Institute for Medical Research with the preparation, preservation, and international distribution of the standards of the arsphenamine group. The standard for sulpharsphenamine has been maintained at this institute and distributed therefrom on an international basis since 1928, and present indications are that it will only be necessary to maintain international standards for arsphenamine, neoarsphenamine, and sulpharsphenamine.

The total number of international biological standards established by the Commission is now 27. Of these, 12 are standards for antitoxins, antisera, and old tuberculin, and are maintained at the State Serum Institute, Copenhagen; and 15 are standards for drugs, hormones, and vitamins, and are maintained at the National Institute for Medical Research. At these two institutes the standards are available for supply to laboratories and research workers throughout the world. Reports from these institutes deal with the preparation, care, and preservation of the standards and the administrative procedures adopted to bring them into effective use. They draw attention to the increasing demand for the standards and emphasise the need for the establishment of a national centre, or centres, in each country,[2] in order that simplification and economy of administration may be effected, the widest possible application of the standards ensured, and research work in the field of biological standardisation facilitated and advanced.

[2] Report of the Inter-Governmental Conference on Biological Standardisation, *Ibid*, 1935, **4**, 631.

LOUGHBOROUGH QUEEN'S NURSES.—Lady May Abel Smith has opened a new home for Queen's nurses at Loughborough, erected at a cost of £3000.

PARIS

(FROM OUR OWN CORRESPONDENT)

THE CRISIS IN SILK SUTURES

THE recent history of the vicissitudes of the silk suture industry was given at a meeting of the Academy of Medicine on Feb. 16th by Dr. E. Perrot and Dr. P. Bruère. Though the prospect of the supply of silk sutures from Spain being cut off owing to the civil war is the immediate cause of the alarm felt in France at present, the question of making the country independent of foreign supplies is many years old. The term applied to surgical silk, "crin de Florence," owes its origin to the fact that certain natives of Tuscany emigrated into the valley of the Rhone, bringing with them the industry of fishing silk. This was first introduced into France for the benefit of fishermen in 1760, and it was not till 1877 that Trélat found such silk suitable for ligatures in surgery. Soon after the late war the question of manufacturing surgical silk was submitted to a special commission, and in due course a model organisation was set up at Alès (Gard). All went so well that by 1930 the home product was found by experts to be quite equal in quality to the imported article, and for a time it looked as if French-made surgical silk had come to stay, but at this stage a dismal concatenation of circumstances upset the whole scheme. At the present time the surgical requirements of France every year amount to more than two million silk threads, 1,400,000 being required for the civilian population and for export, 500,000 for the Assistance Publique, and 100,000 for the army. It was calculated in 1925 that a million threads per month would be required by the army on mobilisation.

ARE EXAMINERS HUMAN?

The recent publication of letters in the medical press on the subject of examinations, examiners, and examinees is a reminder that the problem does not begin and end with "satisfying the examiners." The examinees and their parents must also be satisfied, more or less, not to mention co-examiners or assessors. Prof. Pierre Mauriac [1] has unburdened himself on this subject with disarming frankness and in the spirit of a co-examiner rather than in that of the examiner himself. Is, he asks, strict impartiality possible? Then he startles his readers by asking if it is even desirable. He seems to wish to endow the examiner with a certain latitude in the matter of the personal and moral qualities of the examinee; thus the anonymous examination may not be altogether suitable. The reform of the examiner must come from the examinee, and though, in Prof. Mauriac's opinion, the examinee may be ill qualified to appreciate the scientific merits of his examiners, he is the best judge of their value as teachers. Among the peccant examiners pilloried by Prof. Mauriac is the one who must needs drag in his specialties and expect the examinee to know all about them. Another type is he who wanders from his own to other fields, coquetting with medicine if he is a surgeon, and committing "howlers" damaging to his reputation. Prof. Jean Delmas [2] has described yet another kind of examiner who is all out for orthodoxy, giving full marks for the text-book mentality, and to whom individuality and independence of thought are anathema. It seems from this discussion that the impersonal, machine-minded examiner is inhuman, and his erratic, fad-loving colleague is even more execrable, and one wonders if the difficulty could not best be met by the appointment of a board of super-examiners composed of examinees. This is what Prof. Mauriac implies is already the case, but in an informal way.

[1] *Pr. méd.* Jan. 30th, 1937, p. 165.
[2] *Ibid.* Feb. 27th, 1937, p. 325.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

BICENTENARY OF THE ROYAL MEDICAL SOCIETY

DURING the week ending Feb. 27th the principal celebrations in connexion with the bicentenary of the Royal Medical Society have taken place, and a large number of senior members from all parts of the country attended. The presidents for the year are Dr. A. G. Ross Lowden, Dr. R. F. Dawson, Dr. J. M. Macfie, and Dr. A. S. Crawford, and on Feb. 25th they held a reception in the society's premises, which gave senior members the opportunity of inspecting the many improvements that had recently been carried out in the buildings and in the library. At the annual dinner on the same evening about 250 were present.

Dr. Robert Hutchison proposed, as the toast of the evening, The Royal Medical Society. It seemed, he said, to have been robust from its start and it had never looked back. Before it had reached its fiftieth year it had built a hall and received its Royal Charter and it had begun to collect a library. The modest sum that the society aimed at collecting in celebration of its bicentenary was still far from being reached. Surely the present members would not allow themselves to be out-done in zeal by their forefathers. The society succeeded where others had failed because it must have proved itself complementary to the education of the class-rooms and the infirmary. It provided a means of self-expression—a safety valve by which the student might blow off as much steam as he liked. The medical student, and never more so than to-day, was like the Strasbourg goose: he was crammed with facts until he got fatty degeneration not, it was true, of the liver, but, what was worse, of the brain. Argument and refutation, ridicule and laughter were the aids to mental digestion, and these the Royal Medical had always provided in abundance. Dr. Hutchison added that he believed that the most important principle in the training of doctors was expressed in the old saw, "you can't have the terriers too soon at the rats"—in other words, you cannot bring the student too soon into contact with the patient. Finally, the Royal Medical satisfied the need of the student for the society and intellectual companionship of his fellows. It had survived many troublous times; it had seen the '45, the loss of the American colonies, the French Revolution, the Napoleonic wars, the comparative peace of the Victorian era, and the catastrophe of the late war. The present times held a new threat to intellectual life in the suppression of free discussion in other countries. There was all the more need, therefore, for those societies in which intellectual freedom was the breath of life.

Dr. Ross Lowden, the senior president, said that he intended to send a telegram of greeting to the society's oldest member, Sir James Crichton Browne, who signed the obligation in 1858. He reported that the society was in a flourishing position with 66 new members in the year. The bicentenary endowment fund now totalled about £1800, and though the sum aimed at was £3000 it is to be hoped that steps could be taken to preserve the most valuable old books in the society's library.

A VOICE FROM THE GRAND-STAND

Sir Auckland Geddes, formerly a president of the Royal Medical Society, gave an address on Feb. 26th to a crowded meeting of the society, at which Dr. Ross Lowden presided. Sir Auckland Geddes said that for many years his path had lain far from the profession of medicine and that he felt like a spectator who, on the strength of a precarious membership of his school third XV forty years ago, shouted advice and criticism to the international players. The more he had seen of life and death, of pain and suffering, the more clearly he had realised, however, that there was never in the real world outside the walls of the medical school and teaching hospital a "disease" to be treated or an "injury" to be dealt with: there was just a sick child, woman, or man to be helped to get well. He had gradually gained the impression that on average young doctors had surprisingly little understanding of man, and the medical profession had been losing something of the public's respect and trust. The real business of clinical medicine was not science; it was a personal relationship into which much sincerity and medical knowledge were suffused by the physician, and trust and some dependence by the patient. In this respect there seemed to be a lag in progress at present in the preparation of the medical student, for no amount of scientific knowledge, unless it be subordinate to understanding the individual, could make the medical man a true healer; far too often a doctor attending patients had irresistibly reminded him of a vet attending sheep. He thought this was because too many were being demoralised by panel practice and because too many came to the sick room thinking of themselves as men of science fighting disease and not as healers with a little knowledge helping nature to get a sick man well. Beyond their scientific knowledge of man lay an incompletely explored area in which important things happened without discoverable physical cause. In spite of the brilliant record and achievement of science they must realise the fact that to-day science was running into blind alleys from which it can only emerge by escaping from direct touch with human understanding. They could not grasp man as a whole, but this did not mean that it was impossible to improve their understanding. On the contrary, once they had ceased to fear what seemed to them nonrational and recognised that human reason could not grasp all reality they could get to know a good deal about man.

TREATMENT OF TABES DORSALIS

Dr. Robert Lees gave some observations on the treatment of tabes dorsalis at a meeting of the Medico-Chirurgical Society of Edinburgh last week. He analysed the results of treatment in 200 patients who had been observed for a period of not less than two years and all of whom had been treated at the Edinburgh Royal Infirmary. He excluded any cases in which the diagnosis was in doubt. The routine examination in each case included clinical examination, especially of the nervous system, and examinations of the blood, the cerebro-spinal fluid, the optic discs, the fields of vision, and the urine and teeth, especially for evidence of local sepsis. Several of the patients in the series have been attending the department for as long as 15 years. There were 81 per cent. with a positive Wassermann reaction in the cerebro-spinal fluid, but after two years' treatment 75 per cent. of these showed a definite improvement. In general the serological and clinical response appeared to be parallel, but there were some patients with negative findings but severe clinical symptoms. All cases that became negative under treatment remained negative when it ceased. The treatment consisted of the administration of tryparsamide intravenously and bismuth intramuscularly. Both injections are given at the same time and in courses of weekly injections for ten successive weeks, with an interval of one month, when the course is repeated. The maximum benefit was seldom obtained in less than two years and sometimes not for five. After the treatment is completed the patient is asked to report every 3–6 months for an indefinite period. Very few complications or toxic effects were observed; the danger of toxic amblyopia has probably been exaggerated and Dr. Lees does not hesitate to treat cases of optic atrophy with tryparsamide. He reported that in patients with tabetic pains there was definite improvement in 75 per cent.; in 16 per cent. these were unaffected, while in 5 per cent. they became worse. As regards ataxia, 65 per cent. improved, 6 per cent. became worse, and the remainder showed no change. In two cases of rectal crises the results were very satisfactory. Charcot's joints occurred in 4 per cent. and the treatment appeared to benefit the general condition of these patients. There were definite signs of optic atrophy in 12 per cent. of the series. Tryparsamide therapy was carried out with the careful coöperation of ophthalmologists, who observed the state of the visual field. All methods give poor results with this condition, but both in the present series and in a series previously investigated by the late Dr. David Lees 50 per cent. of those treated did not progress to complete blindness. Cases of juvenile tabes usually respond well to treatment. Finally, Dr. Lees concluded that the treatment carried out was justified by the satisfactory results obtained. In his opinion a very prolonged period of treatment and observation is essential.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 27TH, 1937

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1619; diphtheria, 1252; enteric fever, 45; pneumonia (primary or influenzal), 1372; puerperal fever, 53; puerperal pyrexia, 107; cerebro-spinal fever, 15; acute poliomyelitis, 4; acute polio-encephalitis, 2; encephalitis lethargica, 8; dysentery, 21; ophthalmia neonatorum, 71. No case of cholera, plague, or typhus fever was notified during the week.

Notifications of acute pneumonia were much below expectation: in London 39 per cent. below; in the country as a whole 16 per cent. below.

The number of cases in the Infectious Hospitals of the London County Council on March 5th was 3353, which included: Scarlet fever, 858; diphtheria, 1032; measles, 30; whooping-cough, 584; puerperal fever, 17 mothers (plus 10 babies); encephalitis lethargica, 283; poliomyelitis, 3. At St. Margaret's Hospital there were 19 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 122 great towns, including London, there was no death from small-pox, 4 (0) from enteric fever, 7 (1) from measles, 5 (1) from scarlet fever, 31 (10) from whooping-cough, 26 (1) from diphtheria, 43 (11) from diarrhœa and enteritis under two years, and 242 (23) from influenza. The figures in parentheses are those for London itself.

Of the 204 deatns from influenza in the great towns of England and Wales outside Greater London, the largest totals were reported from Liverpool 12, Manchester and Birmingham each 11, Newcastle-on-Tyne 10. Corresponding figures for Scottish and Irish towns were Edinburgh 5, Glasgow 9, Dublin 6, Belfast 6.

Leeds, Liverpool, Birmingham, and Bristol each had a single death from enteric fever. Hull reported 2 deaths from measles. Fatal cases of whooping-cough were scattered over 19 great towns: Leeds reported 3, Birmingham 2. Fatal diphtheria was reported from 22 great towns: 3 from Liverpool, 2 each from Manchester and Sheffield.

The number of stillbirths notified during the week was 277 (corresponding to a rate of 43 per 1000 total births), including 36 in London.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index.

FROM A RUSTICATING PATHOLOGIST

III

Dr. Carrel's "Man the Unknown" is a strange book. In manner it is thoroughly up to date for there is no *continuum*; it proceeds by quanta and school-children who were set to parse it would have to get out of their difficulties by classing a good proportion as "exclamatory." And it is said to have been a best-seller in America. It will be interesting to see whether it has the same popularity here: still, our literary tastes are peculiar; are we not said to be the only people who find *Punch* funny? But in whatever style he writes, Dr. Carrel succeeds in getting his meaning across as well as many other people, and it is naturally with the meaning that we are concerned. Knowing something of his laboratory work on tissue culture, the healing of wounds and suchlike matters, we should have suspected or even been convinced that he was one of those austere men of science who hold that the real truth is bounded by what can be ascertained by exact quantitative experimentation; indeed, it has seemed perhaps sometimes that his passion for meticulous preciosity in method has taken up more of his attention than the results he has been after. What is so interesting about the book is that it reveals him as quite a different kind of man. As one would expect, there is much excellent exposition of what may be called conventional scientific knowledge about the body and its tissues. But he goes far beyond this. He is prepared to believe in what he cannot understand, which has commonly been supposed to be the mark of the loose-minded fellow in contrast to the real scientist. The most scientific scientists of course believe, perhaps inadvertently, in some things which they cannot understand—e.g., gravity—and may hold that some result is the effect of a cause when they cannot trace the intermediate steps. But this is not considered in general quite the right thing to do. Yet Dr. Carrel (see particularly his chapter on "Adaptive Functions") is frankly teleological; the body reacts in such-and-such a way to changes in itself or its surroundings in order that it may reach a certain end, the tissues behave in short as if they were sentient human beings. A number of people who have looked at the known facts with such honesty as they could muster have come to the same conclusion and it is likely enough that it is as near the truth as we can get, at any rate just now; I believe myself that the most fruitful way of looking at pathological reactions is from the end which they aim at or reach, but the point of view is unconventional, and it is interesting to find it in Dr. Carrel: most people still hold that what the body does is determined by the mechanisms which are available, and it is not long since the late regius professor of physic in the University of Cambridge declared that neo-vitalism died with J. S. Haldane. Going further still, we find that Dr. Carrel believes that intuition is a valid method of scientific discovery, and says "clairvoyance and telepathy are a primary datum of scientific observation," though the phenomena are exceptional and elusive and cannot be reproduced at will; he also agrees that some miraculous cures are effected at Lourdes, though seldom. This open-minded attitude on matters to which orthodox science is commonly wholly indifferent or hostile seems to me admirable, if only because it may stimulate more detailed investigation. In fact there is a great deal to be said in favour of his nonconformity. There is a book of which all I remember is that it was bound in black and was by a Scotch presbyterian minister intimate with Kelvin and Tait and other great discoverers of his time, which argued that scientific progress seemed to depend on something very like the messages from Heaven received by the Old Testament prophets. And intuition is obviously important, however it comes about; it may be the unconscious summation of knowledge and experience; it may be a capacity to hear a still small voice, but whatever it is, it works. Telepathy too appears to be simple fact of experience, uncontrollable, useless, not very interesting. And if a blister with all the classical phenomena of local inflammation can be produced by suggestion, as it undoubtedly can, it is not inconceivable that prayer may be helpful in getting sick people cured, as Dr. Carrel thinks. And he is, as he says in the preface, a man of science.

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Dr. Carrel deals as much with questions of opinion as with questions of fact. And his readers' confidence in his opinions would be the stronger if they could feel quite sure of his facts. It is difficult to avoid a certain amount of doubt. He says for instance that "we know that in countries where water is rich in calcium, the skeleton becomes heavier than it does in regions where the water is quite pure." Do we? Is it really true that people who drink the almost distilled water supplied to Glasgow have lighter skeletons than the corresponding Londoners whose water contains 20 or 30 times as much calcium? If it were, it would be strange, for the water we drink is not the main source of the body's calcium. And the hygienist may well ask where is the elysium when the water is "quite pure." Or again: "It is remarkable that mental diseases by themselves are more numerous than all the other diseases put together . . . one person out of every twenty-two has to be placed in an asylum at some time or other." What does it mean? At a modest computation 21·9 out of every twenty-two people suffer from some other disease at some time or other. But of course all persons with "mental diseases" are not detained in institutions, which really take notice of disorders of conduct rather than disorders of mind; if a man walks down the street every day whistling "Slippin' round the corner" he can still go free as a respectable citizen, whereas if he goes without his trousers he will probably be shut up. Is it both or neither or which that is afflicted with mental disease? Dr. Carrel would do well to reconsider his terrifying statement, which frankly is not the sort of thing that we have learned to expect from "a man of science" or from the Rockefeller Institute, not because it is questionable but because its meaning is quite obscure. Or take this piece of voluptuous fiction: "Moral sense is almost completely ignored by modern society. . . . Those who discern good and evil, who are industrious and provident, remain poor and are looked upon as morons . . . Artists and men of science supply

the community with beauty, health, and wealth. They live and die in poverty," and so on for about a page. What a fantastic travesty of a world permeated all through with goodness and kindness and justice—yes, even in New York—and where even most scientists are not at all badly paid. One might as well say that "No Mean City" is an accurate view of a cross-section of the citizens of Glasgow. It is perhaps right to accentuate the existence of the few bad and the more foolish people there are in the world because they want dealing with, but to brand all men as robbers because of a few thieves, or all women as loose-living because of a few prostitutes is the negation of all that science has ever stood for. Man has a natural passion for righteousness just as he has a natural passion for knowledge, and the vast majority of mankind tend to do good in so far as it is known to them. Without these natural qualities, education would, it seems to me, be futile: we cannot alter man fundamentally; our business is to make the best of what is there. It is with shame that I recall and recite a rebuke I had not so many years ago: "Jones was extraordinarily nice about that business," I said, and the answer came, "Why do you think so badly of him? isn't it quite ordinary for people to be nice?" Of course it is, and perhaps it is just a general realisation of this that leads to the worser daily papers (and to some extent also the best) and the "News Bulletin, copyright reserved" that comes over in that honeyed voice, and Dr. Carrel to draw such a horrid picture of the world; what is normal and customary has no news value. Similarly people glorify the past and talk of the good old days which, I have no doubt, were on our present standards as bad as bad could be. It is entirely false, for example, to suppose, as many people seem to do, that our ancestors built better houses and made more durable furniture than we do to-day. What they rightly admire is the selected few examples which survive; the majority of houses built 200 or 300 years ago have disappeared altogether because they were intolerably bad, most of those which are still here are poor places to live in—damp, dark, with ill-fitting doors and windows: for living in rather than looking at they are nowhere near the council houses of the last 20 years. So too with the body. We hear a great deal of physical degeneration and the evils of coaxing unwilling infants to survive but, judging the past as best we may, it seems clear that the people of this country are now more fitted to live human lives than they have ever been before; my mother wore a cap and sat in a chair at an age when my wife does a good day's gardening and enjoys it. Look at the amount of illness, people say; yes, but look at the change of standard. Hospitals used to be places for people to die in and the doctor was summoned as the last resort in a desperate situation; he is sent for now if the patient has a suspicion that he may be going to be ill to-morrow, which is why there are now more doctors and busier ones than there used to be and at the same time on the same criterion less illness. The present is indeed very much better than the past and the intellectual and moral gain is as great as the physical. Some of my friends are very loath to believe that people now are better than they were, but it seems to me one of the most patent facts of experience that during my own life-time there has been a substantial increase in the virtues which I can perhaps best sum up as disinterestedness—unselfishness kindness, generosity, toleration. The reason for it I would not try to make out but there it is, and it is a pleasing and encouraging thing to think about. It is as nasty and depressing to reflect that we are no doubt accepting many things as tolerable or even admirable which in another generation or two will be recognised as abominable; our sins and negligencies are bad enough, but I suspect that our ignorances are far worse.

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All this reminds me of some strange talk that has been about in recent years about what is called the impact of science on society. Presidents of the British Association and others have gloomily wondered whether man's morals are up to coping with the powers which science has placed in his hands; they suggest that unless we destroy science, science will destroy us and propose that there shall be a ten years' holiday from further scientific discovery to give us a chance to recover our equilibrium. What they really seem to mean is that it is a pity that engineer's brains should go into bombing aeroplanes and motor-cars which facilitate large-scale burglary or that chemists should spend their energies on poison gas; but they express themselves, and perhaps actually feel the situation, in more general terms, and there seems to be some chance that nervous ladies will be looking under their beds for scientists as well as communists. There is in short a feeling about that science is something to be afraid of. It is hard to understand why; we have known for a long time that it was one of the attributes of God to tell the number of the stars and call them all by their names. The current feeling seems to come in the main from two misconceptions.

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The difference in the machinery of our lives which has been made by scientific discovery in the last forty years is in general greatly exaggerated, and the unfortunate hyperbolic habit of talk which has grown up is always finding that some pretty ordinary event is an "unparallelled situation" or an "unprecedented crisis" and the world, the Empire, the church, and what not are always arriving at cross-roads, the places where suicides were buried and where black cats had their throats cut on Friday nights to get blood to cure warts. Do we not grossly over-estimate the importance of what happens in our own time? Aeroplanes, motor-cars, and wireless are noisy and dramatic, but do they really represent more than quantitative improvements on ships which could sail against the wind, hard roads, and the old semaphore which itself was not much quicker than the method of throwing a message wrapped round a stone from hand to hand? We can hardly doubt that these things are genuine improvements: the pictures of heaven which men have drawn differ in detail, but they all agree that time and space are abolished and anything which helps towards this ideal is welcome. But they do not seem more dangerous than most of the other improvements which man has made—sharp knives, the possibility of keeping cattle alive through the winter on cabbages and roots, the rotation of crops, steam engines, and all the rest. Everyone of these can be used to promote the ends of bad as well as of good men. If people want to kill one another, they will use the best means which are available and if these are denied them they will use the next best, and so on. What shocks us all so much is to realise that men of ill will make such a splash in the world: for this scientific discovery is in no way to blame and to wipe it out or to prevent its further progress would have not the least effect.

* * *

And the existence of men of ill will seems difficult to avoid. Men have always dreamed of a time when

knowledge would be complete and when everyone would be good. But the ideas are illusory: the world is not made in that way, comfortable as it would be to think so. The horizon of goodness, like the horizon of knowledge, fades for ever and for ever as we move; what was good yesterday may be bad to-day, and what is good to-day may be bad to-morrow. It is not long since murder was nothing more than a civil offence against the dead man's relations; lying was so little condemned that if it was profitable to the liar it counted as a virtue and so it is now in some savage tribes; unkindness was not one of the seven deadly sins; it was as lately as June, 1785 that Thomas Clarkson rode down the hill to Wadesmill beyond Ware and resolved to devote his life to the suppression of slavery as the monument there commemorates. And the course of the evolution of our moral sense is certainly no haphazard series of accidents, for it has always run in the direction of realising that what was thought good is actually bad: usury is the only exception I can think of. There are therefore at any one time various human actions about which there is a difference of opinion: bull-baiting is bad, fox-hunting is doubtful; drunkenness is perhaps just about ceasing to be doubtful; gambling is doubtful, and I remember Webb saying in a Fabian lecture "I wonder when we shall have a stop in the mind about living on rent"; J. L. Paton said that unpunctuality was a sin because it was selfishness and some people (including myself) think that the Zoo is not at all nice. If we include other countries than our own, the range of opinion about right and wrong becomes much wider. Hence good and evil are relative to the prevailing conditions and there is no more prospect of a state of existence in which there is no evil than there is of one in which we know everything. Quite likely man is, on the average, always about the same distance from the ethical horizon which he can see; some get nearer than others and the laggards are the bad people who make such an impression on Dr. Carrel. It all follows from the "Origin of Species" and the normal curve of variation.

CORRESPONDENCE

THE DANGERS OF OVER-STATEMENT

To the Editor of THE LANCET

SIR,—Are we not becoming too violent in our language when we criticise treatment of the past while advocating new methods? Thus I read in your journal to-day: "Failure to apply this treatment is tantamount to criminal neglect." Conduct, be it noted, that not only lays the practitioner open to damages in a civil court but also should be punished by imprisonment. In his memoirs Mr. J. A. Spender tells how as he became experienced with leading articles he found himself writing the more moderately the more strongly he felt on the subject in hand. It is a pity, therefore, that language so strong, which could never be supported in either a civil or a criminal court, should be used to damage a good cause.

Those who have, from time to time, to act as mediators in cases of a quasi-judicial nature in a committee of doctors and of medically minded laymen will realise how hard it is to weigh the pros and cons of any complaint in the face of a statement such as this. How much more difficult it must be when it is a question of defending a case in a court of law in which the obiter dicta of the great carry so much weight. On this occasion you were quoting the words of a surgeon whom to-day we all respect and a teacher from whom we all have learnt. May I, however, point out that there seems to be a growing tendency in your journal to make statements in a phraseology which is more dogmatic than the judicial nature of the anonymous editorial chair seems to warrant. Thus in August last (1936, **2**, 270) you wrote in an annotation, "The advantages of basal narcosis for children are undoubted, whatever opinions may be held with regard to the same procedure for adult patients." This is a hard saying for one who is beginning to wonder whether these same drugs give all the advantages they are reputed to do, and whether, except under the rarest circumstances, they should ever be used in children. Again in a leading article on Dec. 5th last (1936, **2**, 1339) you wrote that "... it has become an imperative duty to employ them [i.e., a new proprietary drug or its substitute] ... in severe forms of streptococcal infection." Before reading Dr. Colebrook's article in your journal of that date I had not heard of such drugs. In the last twenty years many proprietary drugs have been put on the market that were to cut short the illness in streptococcal infections and that have all proved valueless. We may therefore forgive the senior members of the profession if they do not rush at every new one that comes along. One might rewrite the sentence thus: "It looks as though, at last, a drug has been discovered that may help us in the management of the severer forms of streptococcal infection." But we should not criticise any experienced practitioner who, faced with a problem that he knows he has a good chance of solving, refrains from using a drug that may so alter the course of the disease that it disturbs his judgment in the management of the patient. It is not until these drugs have been proved to act with the certainty of diphtheria antitoxin in the treatment, or of typhoid inoculation in the prevention, of an infective lesion that we should use the word imperative in reference to them. Are we, for instance, certain that so strong a word should be used even for the exhibition of quinine in malaria or the arsenical compounds in syphilis?

May I therefore urge that, while we should keep in touch with youth by understanding and even sharing in their exaggerated terminology in our lighter moments, yet we should, in our practice and teaching of medicine, retain a balance of expression and the use of words in meanings that they have come to hold and not in those weaker ones that they may bear in the future.

I am, Sir, yours faithfully,

London, March 6th. T. B. LAYTON.

*** Sir David Wilkie's words were: "The profession has never sufficiently recognised the value of the contribution made by Bier, in the shape of passive congestion, for such infections. I would go so far as to say that to omit the use of passive congestion, in acute infection with lymphangitis, is to be guilty of criminal neglect." An advantage of strong statements of this kind is that they arrest attention, and in welcoming Mr. Layton's wise criticism we are glad to remember his own ability to shock his readers into thinking for themselves.—ED. L.

MANIPULATIVE SURGERY

To the Editor of THE LANCET

SIR,—As I know demands upon your space are numerous, perhaps my esteemed friend, Mr. Blundell Bankart, will forgive me if I confine myself in this letter to what is the all-important question as to whether I do or do not cure true recurrent dislocation of the shoulder by my methods of manipulative surgery? Mr. Bankart criticises Case No. 1 in Mr. Rowley Bristow's report of the demonstration I gave at St. Thomas's Hospital on July 22nd last. Here is the full story:

This patient wrote me as follows on July 11th, 1936: "In 1921 I dislocated my right shoulder and this has continued to recur at intervals which have recently become frequent. I have consulted several doctors who have told me that there is no cure, and that the state of my shoulder must be regarded as permanent."

I afterwards saw this gentleman and selected his case for demonstration: first because of the length of time his disability had lasted; secondly because of the great number of times the dislocation had occurred; and thirdly because of the unanimity of the verdict of the several doctors that his case was incurable.

He told me that the first time the shoulder dislocated the pain of reduction was "excruciating" but that each successive time the dislocation recurred the pain of reduction became less; he never was able to reduce the dislocation himself, but relied on the skill of a friend, who became very expert.

I performed my first and only manipulation on this patient under gas anæsthesia at St. Thomas's on July 22nd, 1936, before about a hundred members of the British Orthopædic Association, and immediately afterwards made him do movements calculated to test the shoulder to its utmost. The joint stood the trial perfectly, neither in the amphitheatre nor in the ante-room later was any suggestion put forward that the case might be other than one of true recurrent dislocation. On Sept. 7th, six weeks after my manipulation, the patient wrote: "My shoulder has given me no trouble of any kind in spite of the fact that my exercises have not been very regular and that I have bathed several times, executing the side-stroke and over-arm, two feats of which I was formerly incapable. I feel that I owe you a very deep debt of gratitude."

On Sept. 10th this patient was re-examined by several surgeons at St. Thomas's Hospital and confirmed the above statement, and added the joint was "perfect." Not until then was it suggested that the case might not be one of true recurrent shoulder dislocation after all! I at once said that if this is not a case of true dislocation what other disability is there which so closely resembles such a condition and which "several doctors" would describe as incurable? I then turned to one of the hospital surgeons standing by and said, "Have you a case of recurrent shoulder dislocation in the wards?" He said, "Yes." The patient was brought up. I examined and questioned him before the surgeons. As he was a hospital patient I asked if they were fully satisfied that the case was one of true recurrent dislocation of the shoulder. They said they were, and I asked if I might operate at once. The permission of the patient having been obtained, gas was administered and I dealt with the case. On Sept. 24th, 1936, 16 days after my operation, this patient wrote: ". . . My shoulder has not given me any trouble. . . ." On Oct. 19th he wrote: ". . . So far I have not had any trouble with my shoulder at all. . . ." On Nov. 12th he wrote: ". . . Up to the present my shoulder has given me no trouble at all. . . ." On Feb. 2nd, 1937, he wrote: ". . . So far my shoulder has behaved excellently and has given no trouble at all. . . ."

In these two cases the first has only had two or three relapses in eight months against frequent dislocations—sometimes daily—in fifteen years, whilst the second has had no further trouble at all. Both patients I believe will be completely and permanently cured judging from my former experiences in such cases.

I am, Sir, yours faithfully,

Palace Hotel, Jersey, March 8th. HERBERT BARKER.

CHEST LEADS IN ELECTROCARDIOGRAPHY

To the Editor of THE LANCET

SIR,—I have read with great interest the two papers and the annotation in your issue of Feb. 27th. It is certainly most desirable that the method of applying the electrodes should be standardised, and that as soon as possible, to avoid needless confusion in an already complex subject.

The preference expressed in your columns for the method used by Drs. Willcox and Lovibond will naturally carry great weight, and deserves careful consideration. But there is much to be said for the retention of the original method of leading used by Wolferth and Wood, and by Wilson (*Heart*, 1933, **16**, 153), the method which is almost universal in the United States, and which I note has been adopted in recent work from Vienna published by Freundlich.

Drs. Willcox and Lovibond state that the fourth lead can be made to conform to the conventional standard leads by simple reversal of the electrode connexions. This is true in a clinical sense—i.e., as regards the general form of the normal tracing—but it should be realised that chest leads differ radically from the standard limb leads. The potential variations are led off in the latter from points which are far, and approximately equidistant, from the heart, the points of attachment of limbs to trunk serving roughly as the angles of the familiar Einthoven triangle. In chest leads, however, one electrode is much nearer the heart than the other, and as Willcox and Lovibond rightly state, the anterior electrode is dominant in virtue of its proximity to the contracting organ. There is thus a fundamental difference between a standard lead electrocardiogram, the algebraic sum of potential variations of equidistant points, and the chest lead electrocardiogram, which reflects particularly the potential variations under the anterior electrode. No modification of technique can render them truly comparable, though a specious resemblance may be achieved.

Further, in physiological studies such as those of Craib and of Wilson it is usual to apply the electrodes to strips of muscle, &c., in such a fashion that activity under the "exploring" electrode causes upward deflection of the string—i.e., the right-arm contact of the string is led off from the muscle, the left-arm contact from a distant or indifferent point. Such leads were used by Wilson and his collaborators in an investigation of experimental coronary occlusion by chest and direct leads in 1932. From this work it would appear that, using Wood and Wolferth's technique, the rapid swing-over from negative Q to positive R (well seen in Fig. 1 of Dr. Freeman's paper, and in Fig. 1c of Drs. Willcox and Lovibond's) denoted arrival of the excitation wave below the anterior electrode—that is, corresponded to the "intrinsic deflection" of Lewis in direct leads from the muscle. As this deflection denoting activity

below the anterior electrode is *upward* when the R.A. contact is on the front of the chest, the Wood-Wolferth technique seems to parallel most closely the leads used in physiological work. That such a parallel is desirable needs no pleading, for in the last resort our understanding of these deflections, like all our electrocardiographic lore, depends on correlation with physiological experiment.

The question thus is one of considerable complexity, and a decision once reached will prove of importance to a great body of clinical and other workers. I question whether a decision in favour of either method could be reached with the facility suggested in your last issue, and I think that the matter is one which might well be referred to a representative body of cardiologists for settlement.

I am, Sir, yours faithfully,

IAN G. W. HILL.

Department of Medicine, University of Aberdeen, March 1st.

THE CONSOLIDATED WORLD RESEARCH SOCIETY LTD.

To the Editor of THE LANCET

SIR,—I have read with much interest your article under the heading Medicine and the Law: Hire-Purchase Research, in THE LANCET of Feb. 6th, as my society, the London and Counties Medical Protection Society Limited, has for a considerable period dealt with a number of complaints by its members against the Consolidated World Research Society Ltd. Not only has it advised its members to discontinue its subscriptions to the Consolidated World Research Society Ltd., but has offered to defend them should proceedings be brought, and in collaboration with its solicitors has repeatedly invited the Consolidated World Research Society to take proceedings, but in no instance has this challenge been accepted. This challenge is still outstanding and will be accepted whole-heartedly should the opportunity occur.

I am, Sir, yours faithfully,

C. M. FEGEN,
Secretary, London and Counties Medical Protection Society Ltd.

March 4th.

FINGER-PRINTS

To the Editor of THE LANCET

SIR,—Your annotation (p. 523) on Wolfgang Abel's observations gives me the opportunity to raise some controversial points. Specialists in a number of different -ologies are now using finger-prints as a tool and in some instances misusing them. Abel's work is the sequel of a laborious series of investigations, carried out in Norway for the most part but confirmed elsewhere, designed to throw light on the interaction of heredity and environment in the formation of papillary patterns. Bonnevie, to whom we owe most of our knowledge, some four or five years ago reached the following position; and after checking various references in Abel's paper I believe it still holds good.[1]

Only three Mendelian couplets are involved. A factor, VV, governs the thickness of the epidermis in early embryonic life; thick skin is dominant to thin; and the heterozygote is intermediate. Two other factors, RR and UU, govern the formation of epidermal pads on the radial and ulnar fingers respectively. Presence of pad is dominant to absence of pad, and the heterozygotic condition leads to thin pad. Three systems of ridges occur: a system starting at the nail fold and growing over the top of the finger; a system starting at the joint fold and spreading distally; and a system beginning in the middle of the ball of the finger at the point where two twigs from the lateral digital nerves meet. These three systems meet at the so-called triradius or delta, and can readily be identified by a glance at the finger-tips except in the case of the triple dominants who may have no loops or whorls but only arches in which case no delta exists.

The endless variety of finger-prints comes about in a curious fashion. The effect of high pressure in the connective tissue of the finger-ball is to expand the finger-tip into a ball, which is perfectly regular so long as the epidermis is of even thickness and elastic. And the triple recessive accordingly sometimes shows regular whorl- or loop-formation on all fingers. In most instances, however, the nerve twigs meet more to one side than the other, and pad-formation, when it occurs, is also slightly asymmetrical. The whole mechanism is obviously highly unstable and easily affected by various external influences. Abel now brings forward evidence, in confirmation of various experiments of Bonnevie, that generalised as well as localised changes of pressure can occur in the finger-tips, which may actually burst the embryonic epidermis and lead to changes obviously recognisable in later life.

This apparently wayward erudition has a very practical bearing on medical research.

Stocks[2] in 1930 claimed to be able to separate twins in nearly every instance, into identical and fraternal pairs by means of their finger-prints. No special acquaintance with the problems of twins or of heredity or of finger-prints was shown in the paper, presumably because the author thought it unnecessary to the development of his argument. The two weak points of the paper, as Stocks himself realised, were firstly that the criterion of resemblance of the finger-prints was entirely subjective, and secondly that no evidence was advanced that an accurate division of the material into identical and fraternal pairs had in fact been made. The second point is unimportant and I do not stress it. To return to the first point; everyone knows the rough classification into whorls, loops, arches; but the difficulties of intermediate forms are not so widely realised. Galton at one time invented as many as 53 different categories, and Bonnevie prophesied that a continuous series might eventually be found. In practice the expert see the differences and the inexpert the resemblances. Stocks apparently can control his judgment fairly well. He writes: "A pair of finger-prints were classed as similar, when they were not merely of the same class (arch, whorl or loop) but so much alike as regards general configuration, inclination of axes, position of deltas and numbers of ridges, as to make them appear the same to a casual examination, without actually counting the ridges or looking for minutiæ." In other words, Stocks managed to keep his eyes sufficiently half shut to identify identical pairs with the same Mendelian composition. Other observers however with an equally large material at their disposal have been unable to utilise Stocks' methods without other aids. Theoretically too the method is unsound. Especially in an inbred area, one must expect to meet with fraternal twins from time to time with the same U.V.R. genetic formula, while owing to the frequent anastomosis of the placental circulations in identical twins, considerable differences in their intra-uterine environment occur. This is of course the explanation of why Siamese twins so seldom resemble each other. These points have been clearly realised by interested biologists for a number of years, and so when it became necessary to look for points to classify twins, characteristics involving a large number of different Mendelian factors comparatively stable against environmental influences were sought for. There is sufficient

[1] See Abel, W. (1936) *Z. Morph. Anthr.* **36**, 1 for literature.

[2] Stocks, P. (1930) *Ann. Eugen., Camb.* **4**, 50.

evidence that the methods employed by the Kaiser-Wilhelm Institut für Anthropologie, which is aiming at a complete follow-up of all German twins and has an enormous material at its disposal, are accurate, and it is a pity that English observers do not report interesting cases in a form which makes them reliable evidence for the world literature.

Lastly, might I add a few words on the point of twin research? Anyone who has the chance to investigate half a dozen identical pairs of twins, where one member has a consistently higher blood pressure than the other member of the pair, or where arterio-sclerosis, gastric ulcer, diabetes, allergic disease, or any other common disease has an asymmetrical incidence learns far more about the practical ætiology and prevention of the disease than any laboratory worker or hospital specialist. Twin research is the only method of distinguishing between hereditary factors, intra-uterine factors, and postnatal factors. That is why these enormous efforts are being made in Germany to clarify the biology of twins. We may be able to adapt German X ray apparatus, endoscopical instruments, and drugs to our purpose, but their twin results will not be applicable, because the two unknowns involved in the sum Heredity × Environment in this country are obviously different.

I am, Sir, yours faithfully,

Oxford, March 1st. DENYS JENNINGS.

RADIOGRAM AND RADIOGRAPH

To the Editor of THE LANCET

SIR,—The varying opinions expressed in your correspondence columns (Jan. 23rd to Feb. 13th) show that unanimity of choice is not possible as far as the words in present use are concerned, and it is obvious that none is completely satisfactory. Your stated preference for the word *radiogram*, however, is a tangible point, and in my opinion a disturbing one, and I am addressing you on behalf of the British Institute of Radiology to urge you to reconsider your decision as to the use of that word.

The etymological points having been exhaustively reviewed, I should like to confine myself to the question of usage. Although the word *radiograph* actually appeared first in medical literature, *radiogram* was not far behind it, and forty years ago their chances of survival were practically equal. Very soon, however, the *radio-telegram* made its appearance, and was most reasonably shortened to *radiogram*. The word has been in use in that sense ever since, and the fact that the same word has lately been adopted as a contraction for *radio-gramophone*, makes it still less desirable to try to bring it back into medical phraseology.

The word *radiograph*, on the other hand, has been used by most radiologists and many of their colleagues ever since as a contraction for what the general public calls an *X ray photograph*. It is by no means an ideal word, especially as it may also denote "an instrument for recording intensity and duration of sunshine"; there can be no doubt, however, as to which of the two meanings is more generally understood. If a better word than *radiograph* could be coined it would be very acceptable, but there appears to be no valid reason for discarding it for a word which has nothing more to recommend it, and which is already in general use under an entirely different meaning. There is something to be said for *X radiograph*, but it is clumsy and would almost certainly be shortened to *radiograph* before long.

I brought this matter up for discussion at last month's meeting of the medical committee of the British Institute of Radiology, which considered that nothing had occurred to alter the opinion which it recorded in November, 1934, when the following resolution was passed: "After discussion it was unanimously agreed that in referring to the photographic product of an X ray examination the word *radiograph* should be used, both as a noun and as a verb, in the same way as the word *photograph* is used. It was pointed out that this is correct according to the Oxford Dictionary."

I am, Sir, yours faithfully,

R. BOULTON MYLES,
Hon. Medical Secretary, British Institute of Radiology.

March 8th.

p-AMINOBENZENESULPHONAMIDE IN BACTERIAL MENINGITIS

To the Editor of THE LANCET

SIR,—We have shown that *p*-aminobenzenesulphonamide has a protective action in meningococcal infection of mice (*Lancet*, 1936, **1**, 1286; 1937, **1**, 16). In the second of these papers evidence was adduced that the drug appears in the cerebro-spinal fluid of rabbits after oral administration. A small inoculum of streptococci failed to grow in the fluid of the treated rabbits, whereas a similar inoculum grew in the fluid taken from the untreated controls. Recently Dr. Fuller (*Lancet*, 1937, **1**, 194) has designed a chemical method for the detection of the sulphonamide in the blood and urine of treated animals. By applying this method it is possible to show that *p*-aminobenzenesulphonamide, given orally, appears in the cerebro-spinal fluid in remarkably high concentrations. For example, a rabbit weighing 3 kg. was given 3 grammes of sulphonamide by the mouth; four hours later 1 ml. of clear cerebro-spinal fluid was removed from the subarachnoid space and a blood sample taken. The amount of sulphonamide in the cerebro-spinal fluid was 0·2 mg. per ml. and that in the blood was 0·3 mg. per ml. The concentration of the drug in the cerebro-spinal fluid is thus 1 in 5000, which has been found sufficient to exert a strong bactericidal effect on the streptococcus in our in-vitro experiments with human blood and on the meningococcus in culture medium. This observation illustrates the remarkable ease with which the drug diffuses through the body, and appears to justify the oral administration of *p*-aminobenzenesulphonamide in the treatment of bacterial meningitis.

We are, Sir, yours faithfully,

H. PROOM,
G. A. H. BUTTLE.

Wellcome Physiological Research Laboratories, Beckenham, Kent, March 3rd.

ROYAL MEDICAL BENEVOLENT FUND

To the Editor of THE LANCET

SIR,—It may be of interest to your readers to have a brief summary of the results up to Dec. 31st, 1936, of our special centenary appeal.

During April, 1936, we posted to 44,694 medical practitioners (at a cost of £590 16*s.*) an appeal signed by Sir Thomas Barlow, president of the Fund, together with an Historical Review of the Hundred Years' Work of the Fund compiled by Sir Humphry Rolleston. The centenary fund was opened by the very generous lead of Sir Thomas Barlow, who made a gift of £1000, which has been followed by 596 donations amounting to £3570 11*s.* 7*d.* It was noted that of these 596 donations no fewer than 337 were from subscribers who already gave annual contributions and only 259 donations were from those who had not previously supported our benevolent work. In addition to the above, after the despatch of the 44,694 appeals, 117 practitioners signified their wish to become annual

subscribers to the amount of £149 10s., and a few old subscribers increased their subscriptions, adding a further £23 12s. to our annual income.

The administrators of the Fund felt that the response from the profession as a whole had been somewhat disappointing, and consequently decided to send out a reminder to the appeal. In November, 1936, at a cost of £65, 6523 letters were posted to practitioners in the postal districts of London who were known not to be subscribers to the Fund and each was asked for a small contribution, such as an annual subscription of 5s. To these letters 286 replies were received, and 220 of the recipients signed banker's orders, thereby becoming annual subscribers of a further £101 5s.

Our committee has decided to keep the centenary fund open until April, 1937, when the centenary year will have ended. A reminder is being sent this month to every practitioner in England, Scotland, and Wales who has not yet responded to the appeal. We earnestly beg of your readers who are not already subscribers to fill in the banker's order for 5s. as soon as they receive this final appeal which will reach them in the course of the next few days.

We are, Sir, yours faithfully,

D'ARCY POWER,
Chairman of Committee.
LEWIS G. GLOVER,
Honorary Treasurer.

11, Chandos-street, Cavendish-square, London, W.1, Feb. 27th.

PROTAMINE INSULIN

To the Editor of THE LANCET

SIR,—The announcement from four British firms in your last issue that a preparation of protamine zinc insulin of British manufacture will now be available in this country is of great interest to everyone occupied with the treatment of diabetes; it is, however, desirable to emphasise the mild words of warning included in the letter announcing its appearance on the market.

The new insulins have come to stay. Their slower action not only enables the physician to reduce the number of daily doses in many cases, but reproduces more exactly the theoretical manner of insulin secretion in health; it is probably on this latter account that so many patients report a considerable improvement in their general feeling of well-being when the new products are employed. But in some instances the change over to one of the new insulins is the herald of a period during which insulin reactions may be frequent and sometimes severe to the point of danger; for this reason the change should only be made when the patient is under close medical supervision, and unless this rule is strictly observed the introduction of the new products may result in major or minor catastrophes liable to mar the record of a most valuable advance in therapeutics.

Having employed protamine insulin for many months I am convinced of its immense value, but I am also familiar with the serious difficulties which must arise when any potent drug is introduced with an action sufficiently slow to carry with it the risks of cumulative effect. When such a substance has the further property of being variable in its potency owing to changes of the amount held in suspension in different conditions, and of being liable to alteration when slightly contaminated by sterilising fluids, it is clear that considerable care is required in its administration.

For these reasons I feel it necessary to express a warning as well as a welcome in this letter.

I am, Sir, yours faithfully,

London, W., March 8th. T. IZOD BENNETT.

A REVIEW OF GOLD THERAPY

To the Editor of THE LANCET

SIR,—In their article in your last issue Copeman and Tegner write: "Other observers (Douthwaite 1936, Pemberton 1936, Hartfall and Garland 1935) have recently reported series of cases successfully treated by means of gold salts, and certain of these express the opinion that such general reactions far from being harmful are almost an essential to success." There is considerable ambiguity in this remark and I, as one of the observers mentioned (the reference, by the way, is incorrectly quoted—it should be 1935), would say that it is not my opinion that the toxic features which may appear during gold treatment have any relation to the ultimate success of such treatment: as I did say in the article to which these authors refer. Further, it is stated that there is general agreement that the use of gold salts in osteo-arthritis may be harmful: I would dissent from this, for at the moment I am finding them an increasingly useful remedy in this condition; and I hope shortly to publish my results.

I am, Sir, yours faithfully,

Liverpool, March 6th. H. S. PEMBERTON

ANALGESIA IN LABOUR

To the Editor of THE LANCET

SIR,—The following case of temporary sterility followed by a normal labour under modern methods of analgesia presents points which may be of general interest, the patient being herself qualified and in medical practice.

At age 34, after five years' married life, she was admitted to hospital for lipiodol injection and radiography. The first injection showed tubes of abnormal outline and doubtful patency; and three small opacities in the position of the left ovary. The second injection under greater pressure appeared to open up the tubes and the radiogram showed lipiodol in the peritoneal cavity and the outline of a dermoid cyst, the three opacities being teeth. The potential risk of torsion and possible effect as a deterrent to pregnancy were considered adequate grounds for removing it. The cyst was found to be inseparable from the left ovary and the mass was removed in toto; a blood cyst was excised from the right ovary, whose covering was abnormally thick; and a pathological appendix was removed at the same time.

Five months later two injections of 1 c.cm. Antuitrin-S were given at intervals of 36 hours at the beginning of a menstrual cycle; the second produced distressing symptoms suggestive of hypoglycæmia, but not the desired result. Six months later again four injections of 0·25 c.cm. were given at intervals of three days, and pregnancy occurred the following month.

A first labour at 36 in a patient with a history of rickets in childhood and only moderate muscular development suggested careful watching in the later stages of pregnancy, and Cæsarean section was discussed; however, the child's head engaged satisfactorily and labour was allowed to proceed naturally, although its onset occurred a fortnight after the expected date. It began at 3 A.M. with a show, and the membranes ruptured at 11.30 A.M.; but pains were not evident until five minutes after an injection of Pitocin at 12.30 P.M. At 2.30 they were beginning to be uncomfortably strong, and thenceforth until the end of the first stage patient inhaled 30 per cent. N_2O in air from a Siebe-Gorman apparatus at every pain. For 5½ hours this gave complete relief without affecting the frequency or effectiveness of the uterine contractions; and between pains she was able to read and even enjoy a tea-party. At 5 P.M. there was barely one finger dilatation. At 8 P.M. the pains began to be so strong as to occasion some discomfort even with the apparatus in action; nevertheless the time seemed to her to pass very quickly as she slept between pains. At 10 P.M., the beginning of the second stage, gas, oxygen, and ether

were given by an anæsthetist, at first intermittently; this was less satisfactory, because owing to the degree of pain needed to wake her from the anæsthetic administered during the previous contraction she had not time to warn the anæsthetist of the onset of the next one and consequently felt each "pain" acutely; and she found the ether very unpleasant. So she was after a short while kept under continuously, and the baby, a girl weighing 9¾ lb., was born at 12.20 A.M. Forceps were used rather to control the head before crowning than because tractive assistance was needed. There was no damage whatever either to mother or child. The mother had remained lying down throughout labour; she did not even brace her feet against the foot of the bed and pull on a towel or "bear down." She did, in fact, nothing but inhale the analgesic at every pain. Twelve hours later she was sitting up in bed enjoying a good meal, and feeling perfectly well, without any stiffness or discomfort whatever.

To sum up, the points of note are: (1) an unsuspected dermoid cyst, diagnosed solely by radiography (possibly the first occasion on which this has been done); (2) pregnancy following its removal and injections of antuitrin-S (there is of course no proof of cause and effect); and (3) the very rapid recovery by a primipara of 36, with only moderate muscular development, from the birth of a 9¾ lb. baby involving twelve hours of strong and frequent pains after premature rupture of membranes. While admitting the unwisdom of generalising from the particular, one is tempted to attribute (3) to the very effective analgesia available, and suggest that the wearing effect of long-drawn-out severe pain in unrelieved labour plays a large part in the exhaustion which too often follows. If there is any truth in this the relief of that pain becomes not a sentimental gesture undertaken from humanitarian motives but a duty incumbent on all of us who are engaged in the effort to reduce maternal mortality and industrial disability.

I am indebted, for permission to publish details of this case, to Mr. L. C. Rivett, who conducted it throughout. I enclose my card, but, the patient being my wife, ask you to suppress my name.

I am, Sir, yours faithfully,

Feb. 20th. M.A. CAMB.

HORMONE TREATMENT OF UNDESCENDED TESTIS

To the Editor of THE LANCET

SIR,—We read with interest in your issue of Feb. 27th the article by Mr. Mimpriss on the hormone treatment of undescended testes, and on the whole agree with the views expressed in the letter from Drs. Bishop and Hampson, who very adequately summarised the present position of this form of treatment in the following week.

In our last 90 cases we have seen only 2 in whom genital hypertrophy became marked; in the majority there was growth of the testes, which was often desirable, and in less than half there was increase in the size of the penis, insufficient to cause any anxiety. We notice that the only patient of Mr. Mimpriss's series in whom there was gross hypertrophy was six years old, which we consider too young for hormone treatment. We are unable to agree with his conclusion that treatment with gonadotropic hormones should be used only in bilateral cases with subnormal genital development, since we have had numerous successes in patients with unilateral maldescent and normally developed genitalia; and we should like to assure him that we have taken especial care to identify the *undescended* and the *retractile* testis. In our experience hormone treatment is more likely to produce descent of the testes than pathological genital hypertrophy. We feel that his lack of success in causing descent of the testes may be partly explained by the short period of treatment in most of his patients and by the fact that some patients received injections only once a week. We consider that twice a week should be the minimum.

In our opinion Drs. Bishop and Hampson go too far in stating that "as the result of continuous administration of gonadotropic extracts, antigonadotropic factors are elaborated in the patient's blood stream which may . . . affect the testis adversely," since as yet there is no evidence that this occurs in man. We are, Sir, yours faithfully,

A. W. SPENCE,
E. F. SCOWEN.

Dunn Laboratories, St. Bartholomew's Hospital and College, E.C., March 10th.

A SPANISH AMBULANCE

To the Editor of THE LANCET

SIR,—Since the fall of Malaga the plight of the wounded and the refugees in southern Spain is very serious. My husband has taken a British University Ambulance Unit to Almeria and has succeeded in establishing a hospital, two front casualty clearing stations, a food station, and children's clinic outside the town on the road to Lorca. He hopes to establish several more at intervals of twenty miles to the point where the railway begins to run again. The unit at present consists of Sir George Young, Miss Thurstan (the commandant), two nurses, three drivers, and two cars and an ambulance. A doctor and two more nurses went out last week. There has been a wide response to appeals for supplies for the unit, but its work is severely hampered for lack of surgeons.

If any fully qualified surgeons were able and willing to go out it is certain that many more lives could be saved. Expenses out and back will be paid; and keep out there. If such there are, I should be most grateful if they would get in touch with me, in the first place, stating for how long they would be able to stay out. I am, Sir, yours faithfully,

J. HELEN YOUNG.

30, Lower Belgrave-street, S.W.1, March 10th.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. J. B. Crawford to *Southampton*; A. W. Cocking to *Pembroke* for R.N.B.; J. C. Brown to R.M. Infirmary Plymouth; and L. S. Goss, O.B.E., to R.N.B., Devonport.

Surg. Lt.-Comdrs. F. W. Besley to *Newcastle*; J. J. Keevil to R.N. Hosp., Gt. Yarmouth; F. W. Gayford to *Revenge*; and F. Dolan to *Warspite*.

Surg. Lt. I. C. Macdonald to *Drake*.

Surg. Lts. (D) D. N. Williamson to R.N.B., Chatham; and H. Bradley-Watson to *Pembroke* for R.M. Infirmary, Chatham.

ARMY MEDICAL SERVICES

Maj.-Gen. G. A. D. Harvey, C.M.G., late R.A.M.C. is apptd. Hon. Physician to the King, vice Maj.-Gen. T. S. Coates, C.B., O.B.E., late R.A.M.C., ret pay.

ROYAL ARMY MEDICAL CORPS

SUPPLEMENTARY RESERVE OF OFFICERS

Lt. R. P. Leake to be Capt.

ROYAL AIR FORCE

Squadron Leader R. L. C. Fisher to Superintendent of the Reserve, Hendon, for duty as Medical Officer.

Flight Lt. R. E. W. Fisher to R.A.F. Station, Aldergrove.

Flying Offrs. J. G. Rountree to No. 5 Armament Training Camp, Penrhos; and A. R. Sibbald to R.A.F. Depôt, Uxbridge.

PUBLIC HEALTH

Another Circular on the Public Health Act

In a circular (No. 1576) issued last November [1] the Minister of Health encouraged local authorities to study the huge consolidating Act passed in June. A second circular just issued (No. 1597, 2*d.*) deals with Parts V, VI, and VII of the Act which directly affect the professional duties of medical officers of health. The repeal in their entirety of the Isolation Hospitals Acts of 1893 and 1901 will be specially welcome, for the boards and committees of these hospitals had become in some districts an obstacle to progress. The most satisfactory of them all, the Metropolitan Asylums Board, has already connived at its own demise; less efficient boards elsewhere have elected to remain in office. They are now to be abolished, their powers being transferred to committees of the county councils which can hardly obstruct the policy of their own medical officers. The Infectious Diseases Notification Act of 1889 is also repealed and the new Act gives one definition of "notifiable disease" instead of three, although even now it has its drawbacks. Notifiable diseases under the new Act are those of the old list of 1889, excluding puerperal fever and continued fever. Plague was not in the original list but was made notifiable later under the Notification Act. That Act being repealed plague ceases to be notifiable in England and Wales after next Oct. 1st unless some special order is made in the meanwhile. Pneumonia (primary and secondary), dysentery, poliomyelitis, polio-encephalitis, encephalitis lethargica, puerperal fever, puerperal pyrexia, ophthalmia neonatorum, and tuberculosis remain notifiable under various unrepealed Acts and orders. But they do not fall within the definition of notifiable disease. The lost opportunity of simplifying the notification of infectious diseases and making it of real value in modern epidemiological practice is a bitter disappointment to many medical officers. The new Act gives the medical officer no new powers, and so far as clinicians are concerned the notification of disease and the procedures of hospitalisation, isolation, disinfection, and control remain substantially as they were. But apart from what directly concerns medicine the Act of 1936 is a great improvement on the old complex legislation. Experienced medical officers will have to discard much that has become second nature with them and to learn a new code of procedure, which is full of slight alterations. But to teachers of hygiene and to D.P.H. students the new Act should bring untold relief, for, with the rest of the codification which has been promised, it should make the learning of such law as is required by practising health officers a comparatively simple business. The present circular mentions every important variation from existing law. Where the circular is silent, the new law is the same as the old, or differs from it only in unimportant particulars. To administrative officers, the Ministry's circulars are more important than the text of the Act itself.

A Hospital Closed for Streptococcal Infection

Dr. R. Campbell Cooke writes: "Owing to the rather highly coloured articles in the daily press about the closing of the Petersfield Hospital owing to infection, it might be of interest to readers to know more details.

"Petersfield Hospital has 40 beds, a nursing staff of 10, and a domestic staff of 4. On Dec. 11th, 1936, a patient was admitted to a private ward with an acute nasal infection, a swabbing of the nose being returned as staphylococcal; three or four days later she developed two supra-orbital abscesses and an abscess in the head of the humerus, and from all three a hæmolytic streptococcus was grown. On Dec. 26th a sister developed a quinsy from which the hæmolytic streptococcus was grown. Two clean operations of Jan. 4th, 1937, broke down on Jan. 8th and 10th respectively, and the hæmolytic streptococcus was grown from their wounds.

"On Jan. 18th all the staff were swabbed and reported to be negative. On Feb. 4th and 5th the cook and kitchen-maid reported throats which were swabbed and returned as positive to hæmolytic streptococcus. The staff was reswabbed and 7 of them returned as positive. There was no alternative but to close the hospital. The Ministry of Health were consulted and they volunteered to type the cases. All staff and patients were reswabbed and 8 of these were positive, but the results of serological tests showed that 4 (2 patients and 2 staff, the nurse who had had quinsy and a healthy probationer) were of the same type, 2 (domestics) were carrying a well-known epidemic type, and 2 (staff) a group that could be ignored, as it did not belong to Group A.

"The hospital has been thoroughly disinfected and will reopen on March 8th."

Facing the Diphtheria Problem

The village of Markfield in Leicestershire has suffered continued recurrences of diphtheria of the grave type which is now prevalent. Everything possible has been done to check the spread of the disease. By "everything" is meant the sanitary routine and ritual which in the past, when dealing with the less virulent type of diphtheria, sometimes marked time with the natural course of epidemics and ended coincidently with them. But Markfield has had no luck and diphtheria continues, much to the chagrin of the medical officer, Dr. T. W. Gordon Kelly, and of the other doctors of the town, who fear, with reason, that the disease will not die out naturally until it has taken its full toll of child life. Dr. Kelly and his colleagues decided to urge immunisation, and for this purpose a public meeting was held by Mr. J. T. Jacques, chairman of Market Bosworth rural district council, at which several doctors, the clerk of the council, and other influential persons pleaded with the parents of the district to have their children immunised. The *Leicester Mercury* ends its report of the meeting with the following sentence:—

"Before the meeting closed the district nurse announced that she had obtained signatures for 50 children to be treated. Several parents signed forms in the room, and others took forms away."

There is agreement that diphtheria can be stemmed by immunisation, which alone of all measures is reliable to keep the disease at its lowest level. Experience on a truly vast scale has proved that the incidence of diphtheria, normally one-tenth of the birth-rate, can be reduced nine-tenths, and fatality, which is about 10 per cent., abolished. Slowly but surely the peoples of the world are accepting diphtheria immunisation, for we have not made the mistake of trying to enforce it, but allowed it to advance on its own merit. In most parts of the country there are no real difficulties, nor obstructions to diphtheria immunisation campaigns though, human nature being what it is, it is always easier to get going during

[1] *Lancet*, 1936, 2, 1168.

a severe epidemic, which theoretically is the least favourable time to start. Leicestershire, however, is a difficult field because of its pronounced anti-vaccination attitude, for the opponents of vaccination are not nice in their discriminations, and carry their opposition to all forms of biological therapy. The people will not be interested in the fundamental distinction between vaccination by attenuated virus and immunisation by detoxicated antigen, but do appreciate the difference between the bad arm—the obvious "disease"—which follows Jennerian vaccination and the silent invisible immunity which follows the injection of antigen.

A condition of success is that there shall be no deception; above all, it must be explained clearly that immunity takes a long time to develop, and that inoculation started during an epidemic will not give immediate safety, though it is safe to promise that it will reduce the chance of death from diphtheria even if the immunity has not had time to be fully established. Though no question remains of immunisation being at least 90 per cent. successful in giving individual protection, we are still in the dark as to what percentage of immunes in a population is necessary to prevent epidemic prevalence arising, or, doing what Markfield wants at present, to bring to an end a nagging prevalence which generally is due to an intermitting carrier. Dr. Kelly and the other doctors at Markfield suggested "not less than 50 per cent"; but we do not know, for there are many factors at play which are at present ill-understood. The objection to immunisation that it increases the carrier-rate may be without foundation, but we are at present ignorant of the relationship of host immunity to toxin with parasite capability to grow on mucous surfaces.

OBITUARY

CHARLES STANSER BOWKER, L.R.C.P., L.R.C.S. Edin.

Dr. Charles Stanser Bowker, who died on Feb. 20th last, was one of the oldest medical practitioners in Monmouthshire, having been in practice at Pontnewydd for more than 40 years. He received his medical education at the London Hospital and the Glasgow Royal Infirmary, and qualified in 1887 as L.R.C.P., L.R.C.S. Edin., and L.R.F.P.S. Glasg. He held resident appointments at the Glasgow Infirmary and was also a house surgeon to the Newport and County Infirmary and the Rotherham Hospital. He went into practice at Pontnewydd nearly 40 years ago, and held local appointments as medical officer, among others that of medical officer to the Post Office and also medical referee to several assurance companies.

Although 50 years of age at the outbreak of the war, he joined up immediately, and with the rank of captain was in turn in charge of the internment camp at Beachley, Chepstow, and the embarkation camp at Southampton. At the time of his death he was director of the Royal Gwent Hospital, Newport.

WILLIAM DENISON WIGGINS, M.R.C.S. Eng., D.P.H.

WE owe the following to a friend and colleague of the late Dr. Wiggins: "Dr. Denison Wiggins's death at St. Alphege's Hospital, Greenwich, on Feb. 26th, at the early age of 63, will come as a shock to his many friends in South London. He had turned his attention mainly to surgery, was a sound operator, and his services were in much request in the district outside the hospital. Born in 1873 at Watlington, he was educated at Magdalen College School, Oxford, and St. Mary's Hospital. He entered the poor-law medical service at once and after a year at the Fulham Infirmary became assistant medical officer at Greenwich rising to be medical superintendent, a position he held for 25 years. As soon as he was appointed he began agitating for better surgical quarters and by great persistence got them so much improved that when the L.C.C. took over it was recognised at once as a surgical centre, and to his intense delight good modern theatres were installed and electrical and light treatment provided for the after-care of orthopædic and other cases. At an early date he organised the nursing school on modern lines and will be long remembered for his extremely practical lectures to the nurses. Here again he saw his ambitions realised when during the last few years one of the finest and most modern nurses' homes in London was completed. In 1904 he published a book on midwifery for nurses, and gave many refresher courses for practising midwives. He reported clinical cases occasionally in the medical press and had always an interesting case or cases to discuss with any medical colleague who came in. He was rather better than most people at any sport that he took up. A golfer of outstanding merit, he was a member of the old Blackheath Golf Club. He was a first-rate shot, a good tennis player, and later when his health began to fail he became rather above the average at croquet. A keen pigeon fancier, he raced his birds as far as the North of Scotland. He played an excellent hand at bridge. A regular attendant at masonic meetings, he had held office as grand master of his lodge. Along with all these interests went an insatiable taste for curios of all sorts. There was hardly a thing in his house that had not some exciting history behind it, and his collection of china and old furniture was extensive. He married Marie Julie Breting of Geneva, who predeceased him, and leaves a son who is a student at Guy's Hospital and one daughter."

ROBERT LACHLAN PINKERTON, M.D. Glasg., J.P.

THE death on Feb. 23rd of Dr. Robert Pinkerton of Norwood removes from the Streatham district a prominent practitioner who also worked actively on behalf of municipal interests in the locality. Born at Paisley he received his medical training at Glasgow University and graduated M.B., C.M. in 1888, proceeding with a short interval to the M.D. degree. He held appointments at the City of London Hospital for Diseases of the Chest, and started practice in Harlesden, but having been resident medical officer of the Surrey Dispensary, he came to South Norwood where he rapidly achieved professional success. He was appointed police surgeon to the South Norwood section, a position which he filled for over thirty years. He was honorary medical referee to the Streatham Home and Hospital for Incurables, had been chairman of the Croydon Medical Association, and also an active member of the executive committee of the Croydon division of the B.M.A. During the war he was civil medical officer to the Croydon War Hospital at Norbury, while his public

activities gained him a position as justice of the peace on the Croydon Borough Bench. Here he proved an acquisition, for he was regularly present at the Wednesday morning courts and devoted much time and thought to the exercise of his duties. He was a trustee of the Stanley Technical Trade School, and held the position of chairman of the board for sixteen years until his death. This occurred suddenly at his home at South Norwood Hill, from a heart attack, but he was carrying out his professional duties to the end. He was 71 years of age.

JOSEPH CLOUGH, M.R.C.S. Eng.

Dr. Joseph Clough, who died last week at Moortown, Leeds, had practised in the Hunslet district for over forty years. He was born at Cleckheaton and received his medical education at the Leeds Medical School. After a period of service at the Bolton Infirmary, he became house physician at the Leeds General Infirmary, being later appointed anæsthetist and assistant pathologist. He was a well-equipped physician, and contributed occasionally to these columns.

FREDERIC WILSON STANSFIELD, M.D. Manch., D.P.H., F.L.S.

WE regret to record the death of Dr. Frederic Stansfield, for many years a leading practitioner in Reading, where his death occurred on Feb. 28th. He was born at Todmorden, the son of Abraham Stansfield, a well-known botanist and nurseryman, and for a time was himself in business as a fern cultivator, but deciding on the medical profession he entered the medical school of Victoria University, Manchester, with an exhibition in physiology. He graduated as M.B., Ch.B. in 1889, proceeding at the shortest interval to the M.D. degree, and in 1893 he obtained the diploma of D.P.H. at Cambridge. In that year he went into practice at Reading and came to hold a prominent position in the profession, being elected president of the Reading Pathological Society and of the Reading and Oxford branch of the B.M.A. He maintained his hereditary and early interest in ferns, contributed papers on the filices to the *Proceedings* of the Linnean Society, of which body he was a fellow, and for a time edited the *British Fern Gazette*. He was in his 83rd year at the time of his death, and had been a widower some years; his son, Dr. T. Stansfield, practises in Reading.

RICHARD CRESSWELL, M.R.C.S. Eng., D.P.H.

Dr. Richard Cresswell, who died early this month in a nursing-home at Bath, was a very senior member of the medical profession, for he qualified 70 years ago as M.R.C.S. Eng., being also one of the earliest to take the diploma of D.P.H. Lond. He held an appointment as a young man at the London Lock Hospital and for a time was in the Colonial Medical Service, being stationed at St. Helena. He then went into practice at Cheltenham where he was for a period medical officer of health to the urban district council. Later he practised in Portishead for some thirty years. He was 93 years old at the time of his death.

CHARLES WILFRED COGHLAN, L.R.C.P., L.R.C.S. Edin.

THE death occurred recently at Longton of Dr. Charles Coghlan, a member of a well-known Longton family of doctors. He received his early education at Ratcliffe College, Leicester, went for his professional training to Edinburgh, and qualified in 1902 as L.R.C.P., L.R.C.S. Edin. and L.R.F.P.S. Glasg. He went into medical practice in York but joined up at the outbreak of war and saw much service in the Near East as an officer in the R.A.M.C. Soldiering was not new to him for he had served for three years in the Royal Scots Volunteers. Unfortunately he contracted malaria and after the cessation of hostilities he retired from practice for a time and travelled much abroad, but later on the death of his brother he returned to carry on the practice. But he was practically an invalid for the rest of his life. He had an extraordinary medical pedigree, being one of seven brothers, of whom one died in infancy, but the other six all entered the medical profession.

PARLIAMENTARY INTELLIGENCE

CRITICISM OF PRISON CONDITIONS

IN the House of Lords on March 3rd the Earl of KINNOULL drew the attention of the Government to the conditions obtaining in H.M. prisons and asked whether the idea of imprisonment to-day was partly one of revenge against the person who had broken the social code, or one of the reform of the prisoner. He had recently read a book called "Walls Have Mouths," by Mr. Macartney, who was an ex-convict. The author described his experiences in Wandsworth Prison before he was sent to Parkhurst convict establishment. While he was at Wandsworth a man was hanged and Mr. Macartney said that one could hear the noise of the drop all over the prison. If that was so (said Lord Kinnoull) surely it was barbarous. Mr. Macartney also said that at Parkhurst in the strong cells there were no windows or heating and men occasionally put in a winter without a blanket, and mostly with only a shirt on. Lord Kinnoull did not think that in the winter one would treat an animal in that way. Another thing that struck him in reading the book was the unnecessary amount of duplication that went on as one passed from one prison to another. The prisoner came before the medical officer and had to give his whole medical history over and over again, although it was all written down on a form in front of the medical officer. He could well understand that the unnecessary amount of nagging by warders drove a person nearly insane after any length of time in prison. Medical men said that monotony of diet over a long time was deleterious to health. In Macartney's book it was stated that the prison doctors at Parkhurst found it necessary to put convicts in hospital for a fortnight—every two years, he thought—and give them hospital diet in order to get away from the routine which they underwent. He thought that the food might be varied a little. Apparently convicts were flogged with a cat-o'-nine tails in all cases of an assault on a warder; that seemed unnecessary brutality. When a man lost his reason for a moment no amount of fear of flogging would stop him. Macartney quoted cases of men who had been flogged several times, but this had not deterred them, but had made them more like brute beasts. He took the view that nearly all people who were convicts had a mental kink, and he thought that at any rate 90 per cent. of them would be far better treated by psychologists than by prison treatment. He found that where people had been sent in for observation because their behaviour was somewhat peculiar they had been kept in the observation landing for years until they had been let out, and when let out they had been promptly discharged to the county asylum. It seemed to him utterly stupid, when quite clearly it must have been known

over a number of years whether a person was mentally deficient, to keep him under a sentence and then discharge him to a mental asylum. There was surely a great need for reform there.

DENIAL OF ALLEGATIONS

The Marquess of DUFFERIN AND AVA said he had never heard a speech containing so many allegations based on one book by one person—and that an ex-convict—without any attempt whatever to produce evidence from outside sources. The assaults on the officers at Parkhurst in 1928, 1929, and 1930 were confined to two, three, and nine cases respectively. He said he would take the responsibility of telling Lord Kinnoull that the story of hearing the drop fall was pure nonsense and complete imagination. It was not possible to hear the drop fall at Wandsworth. In 1910 the prison population of this country was just under 21,000; at the present moment it was only 10,000. Of all the persons recently received into prison for the first time for serious offences during the years 1930–33 80·7 per cent., so far as was known, had not returned to prison a second time up to the end of 1935. Therefore it did seem that reforms had been made, even if Lord Kinnoull thought that they had not gone far enough, in the direction of keeping people out of prison and preventing people who had been in prison from being forced back into criminal life. Solitary confinement had been practically done away with. Every prisoner now, unless there was some medical reason, worked from the very beginning in association with other prisoners. But contamination might easily follow if all sorts of prisoners were allowed to mix freely together. Therefore the object of their reforms had always been to classify prisoners as clearly and as definitely as was within their power. The first and obvious classification had been the institution of Borstal, which had at one stroke taken one-sixth of the prison population and put them into places where they could not be contaminated by older and more vicious criminals. It was obviously very difficult to have a system of classification within the prison itself. It had been the policy of the Commissioners to reserve certain establishments for certain classes of prisoners. Furthermore the Commissioners had developed the very right policy of collecting as far as possible young prisoners between 16 and 21 who were serving very short sentences. But however hard they tried they could not in these collecting centres give the same training as they gave in a Borstal institution. The Commissioners had frequently drawn attention to the fact that magistrates and others who had to administer the law should think again and again before they sent young people to prison, particularly those who had not previously been guilty of offences. In 1935 of the boys sentenced to imprisonment, 38 per cent. had not previously been convicted of an offence and it was the firm conviction of the Commissioners and of the Government that in many of those cases probation would have met the case far better, and that in the remainder of the cases a longer term of Borstal imprisonment would have done the boy far more good. The only consolation was that whereas in 1932 a total of 2653 boys were sentenced to imprisonment the number had fallen to 1608 in 1935. It was the firm policy of the Commissioners at the moment to reduce to a minimum the period during which prisoners were locked in their cells. Since 1934 it had been possible very greatly to increase the staff of prison officers available to look after the prisoners. The spirit of prison reform was very much alive at present. The Commissioners were doing everything in their power to fit these people for the new life they would have to take up when they came out. The Commissioners were fully aware of the importance of the selection of suitable warders. The nagging which had been referred to no longer existed and the present type of warder was quite different from the type upon which Mr. Macartney drew for his imaginary pictures. But he would not like Lord Kinnoull to think that either the Government or the Commissioners were complacent. They were fully aware that there was still much that could be done.—The Earl of KINNOULL said that he was very pleased that some of the allegations of Mr. Macartney had now been denied, because they had never been officially denied before. He was very gratified to hear that reforms were taking place and that more reforms were in contemplation.

NOTES ON CURRENT TOPICS

The Factories Bill in Committee

The Factories Bill was further considered by a standing committee of the House of Commons on March 2nd and 4th.

CUBIC SPACE AND OVERCROWDING

On Clause 2, Mr. ELLIS SMITH moved that the proviso in the Bill, that for five years the figure should be 250 cubic feet and should afterwards continue at the lower figure where a workroom had effective mechanical ventilation, should not apply when overtime was being worked. He said that many of the factory inspectors had very large areas and it might be years before they got round to inspect all the premises in their area. Employers should not be allowed to work people overtime in crowded conditions. The standards they were aiming at setting up under the Bill should be national standards and young people should not be called upon to work overtime in conditions which did not conform with those standards.—Sir J. SIMON said there was a practical difficulty in making one rule regarding overcrowding in a workroom during the period before overtime began and a different rule when overtime began. He was not satisfied with the form of the proviso in the Bill, and it should be modified (cheers). He did not like it in so far as it made possible an indefinite prolongation of the less satisfactory standard of cubic space. They did not intend to allow the proviso to operate for ever.—Sir J. HASLAM agreed that they did not want slum factories to be perpetuated for ever at a time when they were abolishing slum houses. They should be thoughtful and cautious, but bold in regard to factory legislation.—The amendment was withdrawn.

Sir J. SIMON moved an amendment to restrict the reference to five years in the proviso to factories which had been continuously in the same occupation since the date of the passing of the Bill into law.—The amendment was agreed to.

Sir J. SIMON moved a further amendment to alter part of the proviso and provide, among other things, that where effective and suitable mechanical ventilation was not provided the proviso should not continue to apply, although the five years' period had not expired.—The amendment was agreed to.

"REASONABLE TEMPERATURE"

On Clause 3 (which provides that effective provision shall be made for maintaining a reasonable temperature in each workroom but there shall be no escape into the air of fumes likely to be injurious or offensive) Mr. BUCHANAN moved an amendment to delete the word "reasonable" and insert a provision that the temperature should be within the limits of 60°–65° F. He urged that the question of what was a reasonable temperature in a workroom should not be left to the employer.—Sir J. SIMON said that the amendment was not a practical proposal. They could not have a cast-iron rule to deal with the wide varieties of work carried on in different factories. The Secretary of State was given power by a subclause to make regulations with regard to temperature in any particular class of work.—The amendment was withdrawn.

Miss HORSBRUGH moved an amendment to provide that the word "reasonable" should be qualified by the provision "having regard to the purposes for which the premises are used."—Sir J. SIMON said that in interpreting the word "reasonable" the question of the purposes for which premises were used was a factor to be taken into consideration, but it was not the only one. The amendment would

tend to exclude the consideration of whether the temperature was reasonable for the workpeople.—The amendment was withdrawn.

Mr. GRAHAM WHITE moved an amendment to provide that there should be no escape into the air of fumes likely to affect the purity of the air. It was, he said, important that the air in a workshop should not be contaminated. There might be gases which were dangerous but not offensive.—Mr. LLOYD said that the amendment was very similar to an existing provision in the law. The fundamental question was not the purity of the air, but whether there was anything in the air which was injurious or offensive to an individual.—The amendment was withdrawn.

Mr. MANDER moved an amendment to delete the words "is done sitting" in a subclause which provided that in workrooms in which a substantial proportion of the work was done sitting, and did not involve serious physical effort, a temperature of less than 60° F. should not be deemed, after the first hour, to be a reasonable temperature. He said that the phrase "is done sitting" might be a temptation to a few employers not to provide seats.—Mr. LLOYD said the amendment would make the scope of the subsection vague and difficult to enforce. If a gross case of an attempt to avoid the provisions of the Bill came to the attention of the Home Office they would consider prescribing a standard of temperature in that particular class of work.—After further debate, Sir J. SIMON said he would have the matter further considered, and the amendment was withdrawn.

"ADEQUATE VENTILATION"

On Clause 4 (which provides that there shall be effective provisions for securing that a workroom is adequately ventilated and for rendering harmless, so far as practicable, fumes, dust, and other impurities that may be injurious generated in the course of work) Mr. BUCHANAN moved the deletion of the words "so far as practicable."—Mr. LLOYD said it would not be right to make an employer criminally liable when he had done all that was practicable in the circumstances.—The amendment was withdrawn.

Mr. SILVERMAN moved an amendment to add a provision that no mechanical ventilation should be deemed efficient which did not secure such frequency of complete changes of air in a workroom as the Home Secretary might direct.—Sir J. SIMON said that the whole science of ventilation was developing rapidly. The most important inquiries of a practical and scientific kind were going on. He thought it was undesirable to put in a Statute, which might last for many years, what amounted to a limiting provision.—Sir E. GRAHAM-LITTLE said he did not think that attention had been sufficiently given to the importance of changes of the air in the room. It was not a practical proposition to insist on so many changes an hour. There was a far better system that could be adopted, and he regretted that he had not been allowed to move his amendment to provide for testing the ventilation and coolness of the air. He hoped that the Secretary of State would consider the adoption of approved methods used extensively in most progressive Government Departments, including the Home Office and the India Office, to test the efficiency of the ventilation and the temperature of the air. It was a simple scientific instrument in the form of a thermometer, and its value had been tested.—After further discussion the amendment was withdrawn.

"SUITABLE LIGHTING"

On Clause 5 (which provides that effective provision shall be made for maintaining suitable lighting, natural or artificial, in every part of a factory in which persons are working or passing), Mr. CARTLAND moved an amendment to provide that the Home Secretary might by special regulations direct that any operation in a factory should be carried on, where sufficient natural lighting was available, during the day-time. He said it was desirable to deal with those processes which it was undesirable to carry on by artificial lighting. There were industrial processes, such as putting decorations on chocolates for example, which were done by hand and were of a very detailed character. If people did work of that kind by artificial light it strained their eyesight to such an extent that they might be in danger of eventually going blind.—Mr. HAMILTON KERR, who supported the amendment, said that the Institute of Industrial Psychology had carried out exhaustive researches into the question of lighting in factories and they had amply proved the bad effect that poor lighting had on the health and productive capacity of workers. The object of this amendment was to ensure in factories that wherever possible natural lighting should be preferred even to the best artificial lighting.—Sir J. SIMON said that he did not think it was a practical matter to carry out this amendment. If it was generally understood that there would be better work, more production, and more accurate work in many trades when the work was done in daylight than would be the case if the employer went to the expense of installing artificial lighting, then he thought they would encourage people to do the work in daylight. But he would not envy the Home Secretary, whoever he might be, if he had to draw up regulations under this particular amendment. The Committee would appreciate that they were taking a great step forward in Clause 5—the first real step forward in this Bill. There was not in the factory law at present any provision requiring adequate lighting, except in certain dangerous trades. They were doing a pretty big thing in Clause 5 and they ought not to complicate it unnecessarily.—The amendment was withdrawn.

Mr. RIDLEY moved an amendment to delete the proviso that nothing in the clause, or in any regulations made under it, should be construed as enabling directions to be prescribed as to whether any artificial lighting is to be produced by electricity, gas, or any other particular means. He said that he thought the Home Secretary should be in a position to prescribe the precise form of lighting which seemed to be desirable and imperative in order that a sufficient and suitable standard of lighting might be employed.—Sir J. SIMON said he did not wish to use the Factories Bill as an occasion for an argument about the efficiency of different kinds of lighting. It was no part of the business of the Home Office to say how the lighting was to be produced. What they were concerned with was sufficient and suitable light, and not with how the light was produced.—Mr. BROAD said that for most industrial processes where fine work and steadiness of hand were required gas lighting was obsolete. If it was necessary for the safety of the worker to put in electric light the Secretary of State would not be able to prescribe it. The Bill prescribed cubic capacity. Electric light was the only light which would give the power without combustion taking place at the point of illumination, and if they were to have gas light they ought to double the amount of cubic air space, because gas would consume more air than the workers were breathing.—Sir J. SIMON suggested that they should leave out these two extremely provocative words—electricity and gas—and that the words should run "as to whether any artificial lighting is to be produced from any particular source of illumination."—Mr. Ridley's amendment was withdrawn and the amendment suggested by the Home Secretary was agreed to.

In the House of Commons on March 5th the Prohibition of Vivisection on Dogs (Scotland) Bill came on for second reading one minute before 4 o'clock, when the debate was automatically adjourned.

In the House of Lords on March 3rd Viscount GAGE presented a Bill to amend the law with respect to the discharge of trade effluents into public sewers of local authorities.

The Bill was read a first time.

QUESTION TIME

WEDNESDAY, MARCH 3RD

Humidity in Great Britain

Mr. MARKHAM asked the Under-Secretary of State for Air when it was hoped to have published maps showing relative humidity in Great Britain; and whether it was intended to accompany such maps with a new handbook of normals.—Sir P. SASSOON replied: It is estimated that the necessary computations will be completed in about nine months' time and that the maps will be published within 12 months. The average values will be published in a book which will contain maps showing the geographical distribution of relative humidity for each month and for the year as a whole.

THURSDAY, MARCH 4TH

Public Kitchens in Necessitous Areas

Mr. WILSON asked the Minister of Labour whether, in view of the popularity which had attended the establishment of milk bars, he would consider the possibility of setting up in some of the more necessitous areas public kitchens where, at a small cost, the more nutritious kinds of food could be supplied either for consumption on the premises or otherwise.—Mr. ERNEST BROWN replied: The service which the hon. Member suggests should be established does not lie within my powers as Minister of Labour.

Viscountess ASTOR: With whom do the powers lie?

No further answer was given.

Meals at Juvenile Instruction Centres

Mr. GEORGE HALL asked the Minister of Labour whether the National Advisory Council for Juvenile Employment had made any recommendation with regard to the provision of meals at juvenile instruction centres; and whether, in view of the need for improving national physique, the Minister proposed to take steps to provide meals for these juveniles.—Mr. ERNEST BROWN replied: I received a few days ago an interim report on this matter from the National Advisory Council for England and Wales, and am expecting very shortly a report from the Council for Scotland. The recommendations made will be considered at once and a decision taken as soon as possible.

Mr. HALL: Will the report be published?

Mr. BROWN: I hope to make it available as soon as I have considered it.

Women and Young Persons in Textile Factories: the Two-shift System and Overtime

Mr. RILEY asked the Home Secretary how many textile factories, if any, in the West Riding of Yorkshire were working a two-shift system; and how many women and young persons were employed on a two-shift system in such factories.—Sir JOHN SIMON replied: The number of textile factories in the West Riding in which women and young persons over 16 are employed on a two-shift system is 19, and the number of women and young persons so employed is rather over a thousand.

Mr. RILEY asked the Home Secretary in how many textile factories in the West Riding of Yorkshire women and young persons had been employed on overtime beyond 48 hours in any one week; and the approximate number of overtime hours so worked per week for the year ending Dec. 31st, 1936.—Sir JOHN SIMON replied: I regret that the statistics for which the hon. Member asks are not available, but I am informed that a considerable amount of overtime beyond 48 hours was worked last year by women and young persons in the textile factories in the West Riding.

Government and Air-raid Precautions

Mr. JENKINS asked the Home Secretary whether, in view of the differing opinions and the public concern as to the effectiveness of the air-raid precautions now in course of preparation, he would undertake to submit all the information to an impartial group of competent persons for examination and report.—Mr. GEOFFREY LLOYD replied: In devising measures of air-raid precautions, the Government avails itself of the best advice available; and my right hon. friend sees no reason for an inquiry of the kind proposed by the hon. Member.

Mr. JENKINS: Is the hon. gentleman aware that a meeting was held in a committee room of this House at which a number of scientists from Cambridge University met a large number of Members of all political parties, as a result of which grave suspicion has been created in their minds that the Government's provisions up to date are not adequate; and will he take steps to see that the public are given proper assurances that the provisions are the best that can be obtained?

Mr. LLOYD: Perhaps the hon. Member has not followed the answers which I have given recently pointing out that the experiments by these Cambridge scientists are open to very grave objection and are not considered to be of practical value.

Miss WILKINSON: If there is some dispute, and if they question the Government's tests and the Government question their tests, why do the Government refuse to send the matter to some impartial expert body?

Mr. LLOYD: These scientists can be said in general not to have had great experience in this particular technical work, while the Government are advised by many of the principal professors amounting to nearly 100 of various universities, as well as other experts, including those of the chemical industries who have had the greatest experience in the country in this work.

Mr. JENKINS: Is the hon. gentleman aware that at the meeting to which I have referred a letter was read from one of the most highly qualified and most experienced scientists in this country expressing the view that the provisions are totally inadequate and should be inquired into carefully?

Mr. LLOYD: I should be very glad to have that letter.

Air-raid Wardens

Mr. BAXTER asked the Home Secretary if he was now in a position to make any further statement regarding the organisation of air-raid wardens.—Mr. GEOFFREY LLOYD replied: Yes, Sir. A memorandum is being dispatched to-day to borough and district councils, recommending them to organise, in consultation with the police, a service of air-raid wardens, to supplement the normal resources of the civil authorities for safeguarding the general public in the event of air attack. It is proposed that fixed posts should be established from which the wardens should operate. Each post will be responsible for a particular area and it is recommended that the division of towns into suitable areas should be started at once. In residential districts posts should be allotted approximately on the basis of one post to every five hundred inhabitants; while in business areas the distribution of posts would be governed rather by distance—for instance, a post every quarter of a mile might be found suitable. The minimum number of wardens required would be two per post. It is intended that the wardens should be in a position to advise their fellow citizens on the recommended precautions and should be available to give immediate assistance in dealing with air-raid damage. The wardens would probably also be used in connexion with the distribution of civilian respirators. These services would be performed in the neighbourhood of the warden's home or place of business. Volunteers who undertake these responsibilities will be given the training required, and will be supplied by the Government with such equipment as is considered necessary to enable them to carry out their duties effectively. This organisation will constitute an essential supplement to the local authorities' air-raid precautions services, and the Government are confident that a sufficient number of volunteers will be forthcoming for the effective performance of this very important part of the work of civil defence. The memorandum is being placed on sale, and copies are being placed in the library of the House.

Compulsory Pasteurisation of Milk

Mr. ROBERT MORRISON asked the Minister of Health whether, in view of the evidence contained in the annual report of the chief medical officer of his department for 1935 of serious outbreaks of scarlet fever solely due to

the sale of raw milk, he intended to introduce legislation during the present session providing for the compulsory pasteurisation of all milk.—Sir KINGSLEY WOOD replied: I am not in a position to add anything to the reply given to the hon. Member on Nov. 12th last.

Mr. MORRISON: Does the right hon. gentleman realise the dangers of this situation, and does he contemplate legislation?

Sir K. WOOD: I cannot contemplate legislation at the present time.

Workers' Hours

Mr. WILSON asked the Minister of Labour the numbers of insured persons whose ordinary hours of work per week were over 48, 44 to 48, 40 to 43, and under 40.—Mr. ERNEST BROWN replied: For certain groups of industries (textiles, clothing, treatment of non-metalliferous mine and quarry products, and the brick, pottery, glass, and chemical industries) statistics showing the proportions of workpeople, employed by firms who supplied information in response to an inquiry made by my department, whose normal weekly hours, in October, 1935, were less than 44, 44, 44½ to 46¾, 47, 47½ to 47¾, 48, and over 48 respectively, are published on page 48 of the *Ministry of Labour Gazette* for February, 1937. Corresponding statistics for other manufacturing industries, and for certain non-manufacturing industries, are now in preparation and will be published in subsequent issues of the *Gazette*. The particulars given relate to wage-earners; similar figures for insured salary earners are not available.

MONDAY, MARCH 8TH

Typhoid Outbreak in Liverpool

Mr. GROVES asked the Minister of Health whether any investigation had been made into the milk consumed by the sufferers in the recent outbreak of typhoid at Liverpool; and whether the majority obtained their milk from the same source or from different sources.—Sir KINGSLEY WOOD replied: This outbreak has been investigated by officers of the Liverpool City Council, and I am informed that some 60 per cent. of the persons affected obtained their milk-supply from the same retailer. But there is no reason to think that milk was the source of infection in these cases.

Blind Persons and the Poor Law

Miss WARD asked the Minister of Health whether he could announce the introduction of the Bill to extend the principle of removal of the blind from the administration of the poor law, as foreshadowed in his speech at Worcester last September.—Mr. HUDSON, Parliamentary Secretary to the Ministry of Health, replied: This Bill is in course of preparation, but my right hon. friend is not yet in a position to announce the date of its introduction.

M.P.'s and Facilities for Physical Exercise

Sir REGINALD CLARRY asked the Parliamentary Secretary to the Ministry of Health, as representing the First Commissioner of Works, whether he would consider the possibility of setting aside a room and facilities in the House of Commons to enable Members during their hours of attendance to take requisite exercise in conformity with the general desire for a keep-fit campaign.—Mr. R. S. HUDSON replied: My noble friend has considered the matter in consultation with the authorities of this House. He has much sympathy with the request of my hon. friend, but regrets that the demand on the accommodation for the purposes of public business is so great that it is not possible to accede to it.

Ministry of Labour versus a Manchester Hospital

Mr. ECKERSLEY asked the Parliamentary Secretary to the Ministry of Health, as representing the First Commissioner of Works, whether, before the plans for the new labour exchange in Manchester were approved, full consideration would be given to the value to the city of the Robey-street branch of the Manchester Royal Infirmary and to the necessity for ensuring that the new exchange would not interfere with its light or amenities.

Mr. CARY asked the Minister of Labour whether his attention had been called to the fact that the new labour exchange building which was being erected close to the south wall of the Manchester Royal Infirmary would rob of light and render useless the wards of this institution; and whether, in view of this fact and the fact that a large sum of money had recently been spent on the infirmary, he would give instructions that some other empty space or unused building in the district should be used for this purpose.—Lieut.-Colonel MUIRHEAD replied: I am aware of the position regarding the erection of the new central employment exchange for Manchester, and my right hon. friend and the First Commissioner for Works have discussed the matter with the chairman and other members of the board of the Royal Infirmary. After very careful consideration my right hon. friend has decided that the building of the exchange should proceed, and the contractors are now working on the site.

Demonstration of Anti-Gas Respirator at Westminster

Mr. ASSHETON asked the Home Secretary if he would make arrangements for the exhibition to Members in some convenient place of a respirator of the type designed to protect the civilian population.—Mr. GEOFFREY LLOYD, Under Secretary, Home Office, replied: Yes, Sir. I am arranging for a number of these respirators to be available for inspection by hon. Members in the room off the Members' cloak-room, during the hours while the House is sitting, on Monday, March 15th, and following days. An officer will be in attendance to assist hon. Members who may wish to try on the respirators and to answer any questions.

TUESDAY, MARCH 9TH

Pensions for Blind Persons

Mr. WESTWOOD asked the Secretary of State for Scotland if a Bill was to be introduced to reduce from 50 to 40 years the age at which pensions might be paid to blind persons.—Mr. ELLIOT: The answer is in the affirmative.

Mental Hygiene Out-patient Clinics in Scotland

Mr. LEONARD asked the Secretary of State for Scotland the number of out-patient clinics functioning under the Board of Control for the use of persons conscious of incipient mental trouble; and whether they were open continuously or at separate advertised periods.—Mr. ELLIOT replied: There are nine mental hygiene out-patient clinics in Scotland—four in Glasgow, three in Edinburgh, one in Paisley, and one in Perth. Seven are attached to general hospitals and all are under the direction of psychiatrists from mental hospitals. They are open at advertised times.

MEDICAL MEMBERS OF THE L.C.C.

ALL ten medical members of the London County Council offered themselves for re-election on March 4th when, outside the City of London, every seat was contested. Two of the candidates were unsuccessful: Dr. Henry Robinson who was defeated in Kensington (North) and Dr. S. McClements in Woolwich (West). Dr. Doris Odlum contested Hammersmith (North) without success. The eight medical men and women who will serve on the Council for the next three years are:

Name	*Representing*	
Dr. C. W. Brook ..	Southwark (North) ..	Lab.
Dr. S. Monckton Copeman	Hampstead	M.R.
Dr. J. A. Gillison ..	Bermondsey (Rotherhithe)	Lab.
Mr. Somerville Hastings	Stepney (Mile End) ..	Lab.
Dr. Bernard Homa ..	Hackney (Central) ..	Lab.
Dr. S. W. Jeger ..	Shoreditch	Lab.
Dr. F. Barrie Lambert	Westminster (St. George's)	M.R.
Miss E. Rickards ..	Greenwich	Lab.

Lab. = Labour. M.R. = Municipal Reform.

The new Council held its first meeting on Wednesday, when Lord Snell was re-elected chairman.

MEDICAL NEWS

University of Cambridge

Dr. E. D. Adrian, F.R.S., Foulerton professor of the Royal Society and fellow of Trinity College, has been appointed to the chair of physiology in succession to Sir Joseph Barcroft, who is retiring on Oct. 1st.

Dr. Adrian, who is 47, was educated at Westminster School, Trinity College, Cambridge, and St. Bartholomew's Hospital medical college. He qualified in 1915 and obtained his M.D. in 1919. After a period as resident medical officer at the National Hospital, Queen-square, he returned to Cambridge as university lecturer in physiology. He was awarded the Rolleston memorial prize in 1916 and the Gedge prize in 1917. He was elected a fellow of the Royal Society in 1923 and the following year a fellow of the Royal College of Physicians of London. He gave the Oliver-Sharpey lectures at the College in 1925, speaking on the interpretation of the electromyogram, and was awarded the Baly medal in 1929. In 1932, jointly with Sir Charles Sherrington, he received the Nobel prize in medicine and physiology, and in the same year he was appointed to the Medical Research Council. In 1934 he was awarded the Royal medal of the Royal Society. Dr. Adrian holds the honorary degrees of D.Sc. of Philadelphia and LL.D. of McGill. His publications include "The Basis of Sensation" published in 1928, and "The Mechanism of Nervous Action" published in 1932. His interest in clinical neurology, first aroused during the late war, has brought his neurophysiological studies into touch with medicine at many points.

University of London

The following have been recognised as teachers in the university and assigned to the faculty of medicine.

Dr. B. W. Town (chemistry, St. Bartholomew's Hospital), Mr. W. M. Colles (chemistry, Guy's Hospital), Mr. Constantine Lambrinudi (orthopædics, Guy's Hospital), Dr. Thomas Anwyl-Davies (venereal diseases, St. Thomas's Hospital), Mr. N. R. Barrett (surgery, St. Thomas's Hospital), Dr. R. K. Bowes (obstetrics and gynæcology, St. Thomas's Hospital), Mr. W. R. Bristow (orthopædics, St. Thomas's Hospital), Dr. G. B. Dowling (dermatology, St. Thomas's Hospital), Mr. P. G. Doyne (ophthalmology, St. Thomas's Hospital), Dr. J. St. C. Elkington (medicine, St. Thomas's Hospital), Dr. Geoffrey Fildes (radiology, St. Thomas's Hospital), Dr. Harold Gardiner-Hill (medicine, St. Thomas's Hospital), Dr. Reginald Hilton (medicine, St. Thomas's Hospital), Mr. W. A. Mill (oto-rhino-laryngology, St. Thomas's Hospital), Mr. D. F. A. Neilson (oto-rhino-laryngology, St. Thomas's Hospital), Dr. G. G. Penman (ophthalmology, St. Thomas's Hospital), Mr. George Perkins (orthopædics, St. Thomas's Hospital), Dr. J. F. Smith (medicine, St. Thomas's Hospital), Mr. B. W. Williams (surgery, St. Thomas's Hospital), Dr. H. B. Wilson (anæsthetics, St. Thomas's Hospital), Dr. A. J. Wrigley (obstetrics and gynæcology, St. Thomas's Hospital), Dr. J. M. Wyatt (obstetrics and gynæcology, St. Thomas's Hospital), Miss C. L. T. Lucas (biology, London (R.F.H.) School of Medicine for Women), and Mr. Harold Davis (pharmacy, University College Hospital).

Mr. C. Jennings Marshall and Mr. C. E. Shattock have been appointed internal and external examiners in surgery in place of Mr. G. T. Mullally and Mr. Davies-Colley, who have resigned. Mr. C. W. G. Bryan has also been appointed a fifth examiner in surgery, to be called on if required, and Prof. Lambert Rogers an associate examiner.

The university medals in pathology, psychological medicine, and surgery have been awarded at the M.D. and M.S. examinations in December to Dr. A. H. T. Robb-Smith (St. Bart.'s), Dr. A. C. Dalzell (King's Coll.), and Mr. J. B. Gilchrist (Middlesex) respectively.

A Carpenter medal, together with a money prize, will be awarded shortly for work of exceptional distinction in statistical, genetic, comparative, or experimental psychology, including the functions of the central nervous system and special senses, for which a doctor's degree (other than the Ph.D.) has been awarded during the last three years. Application should be sent to the academic registrar not later than June 10th.

A public lecture on blood groups and genetics will be given by Dr. V. Friedenreich, of Universitetets Retsmedicinske Institut, Copenhagen, on Wednesday, March 17th, at 5.30 P.M. Dr. R. A. Fisher, F.R.S., will be in the chair. The lecture will be held at the Galton laboratory, University College, W.C., and is open to the public without fee.

Besredka Prize

The laboratories, La Biothérapie, have founded a Besredka prize of Frs.15,000 to be offered annually for an essay, in French, on local immunity in its therapeutic applications. The first award will be made in June, 1938, and entries should be sent to the laboratories, 5, rue Paul-Barruel, Paris XV, before Dec. 31st.

Department of Health for Scotland

Dr. J. M. Mackintosh, medical officer of health and school medical officer for the county of Northampton, has been appointed chief medical officer of the Department of Health in succession to Dr. J. L. Brownlie, who has resigned.

Dr. Mackintosh, who is 46 years of age, was educated at Glasgow High School and Glasgow University. He graduated M.A. in 1911 and M.B. in 1916. He served in the late war as a sergeant in the Royal Army Medical Corps, as a combatant officer in the Cameron Highlanders, and later in charge of a special hospital division. After demobilisation he acted for a year as a medical officer to the Ministry of Pensions, and in 1920 entered the local government service and was appointed assistant medical officer for Dorset. In 1923 he went to Burton-on-Trent in the same capacity, and was there responsible for establishing an orthopædic scheme and a combined health centre and laboratory. After three years as medical officer of health for Leicestershire he took up his present position in 1930. Dr. Mackintosh is a barrister-at-law of Gray's Inn and is the author of reports on rural housing and water-supply. He is chairman of the propaganda committee of the British Social Hygiene Council.

Physical Training in Scotland

Sir Ian Colquhoun has been appointed chairman of the national advisory council appointed to consider the best methods of meeting the needs for physical recreation in Scotland. The members include the following: Dr. W. L. Burgess, Prof. E. P. Cathcart, F.R.S., Lord Clydesdale, M.P., Mr. W. A. Cochrane, Dr. G. C. Cossar, and Colonel P. S. Lelean, F.R.C.S. Captain E. D. Stevenson has been appointed secretary of the council and may be addressed at 4, Great Stuart-street, Edinburgh.

Margaret-street Hospital for Diseases of the Chest, London

On Monday, March 15th, a clinic for the prevention and treatment of hay-fever, which will remain open from 10 A.M. to 1 P.M. daily (except Saturdays and Sundays) until the end of the summer, will be inaugurated at this hospital. The treatment will include intranasal ionisation, and further information may be had from the secretary of the hospital.

Medical Society of London

At a dinner at Claridge's on March 4th celebrating the 162nd anniversary of this society, the first speaker was Lord Wright, the Master of the Rolls. He praised medicine at the expense of law, but quoted from Johnston Abraham's biography of Lettsom the remark about a doctor who always hesitated in drawing conclusions from uncertain premises and appeared to little advantage in the sick-room. Sir William Willcox said that the society still displayed the characteristics aimed at by Lettsom at its foundation; but its discussions steadily became more learned and critical. One could learn more, he thought, by attending a meeting of an hour and a half than by weeks of studying books and medical journals; for one got a proper perspective and truth without embellishment. The financial position of the society was now better perhaps than it had ever been, and nothing was lacking save an endowment fund. The number of fellows exceeded 600, and the average attendance had doubled in twelve years, being now 50. In conclusion, Sir William announced that Dr. Arnold Chaplin had just presented to the society his collection of nearly 400 engravings of medical men, which he hoped might form the nucleus of an even larger collection. Mr. J. E. H. Roberts "dealt with" The Guests, comprehensively yet concisely, and responses came from Lord Burghley, M.P., Sir Arthur MacNalty, and Sir Edward Tindal Atkinson. Lord Burghley, after expressing his respect for doctors and income-tax collectors, turned to the physical state of the nation and deplored the fact that other countries—and not only the dictatorship countries—have stolen a march on us in cultivating physical fitness. In all other respects British social services led the world, and what was chiefly essential at this moment was to stir the imagination of young people. Sir Arthur MacNalty reviewed the relations between the Medical Society of London and preventive medicine, recalling that Lettsom was interested in many of the subjects that engross public health authorities to-day. The closer clinical and preventive medicine could be brought together, he said, the more they would achieve.

Dr. H. J. Shirley, consulting anæsthetist to University College Hospital, has been appointed a deputy lieutenant for the County of London, and Mr. Charles Leonard Isaac, senior surgeon to the Swansea General Hospital, a deputy lieutenant for Glamorgan.

Royal Medical Benevolent Fund

The 101st annual general meeting will be held in the library of the Medical Society of London (11, Chandos-street, Cavendish-square, W.) on Tuesday, March 16th, at 5 P.M. Sir Thomas Barlow, the president, will be in the chair, and the business will comprise the reception of the annual report and statement of accounts and the election of officials and committee of management for the ensuing year.

Laryngo-phoniatry

Ten lectures on this subject will be given from May 31st to June 5th at the Hôpital Bellan, 7, rue du Texel, Paris XIV. Further information may be had from Dr. Jean Tarneaud, 27, avenue de la Grande Armée, Paris XVI.

Eradication of Bed-bugs

In view of the attention which is being devoted by local authorities to the eradication of the bed-bug from houses the Royal Sanitary Institute has arranged two courses of training in the work of disinfestation. They will begin on Tuesday, May 18th, and on Monday, June 7th. Full particulars may be had from the secretary of the institute, 90, Buckingham Palace-road, London, S.W.1.

Society for the Provision of Birth Control Clinics

A lecture on the theory and practice of contraception will be given to medical practitioners and medical students by Dr. Greta Graff on Friday, April 2nd, at 6 P.M., at the Walworth Women's Welfare Centre, 153A, East-street, S.E. Practical demonstrations will be given on Friday, April 9th, at 6 P.M. and at 7 P.M. The lecture and demonstrations will be open to medical practitioners and to all students who have completed their gynæcological course. Tickets may be had in advance from the secretary of the society, 153A, East-street, S.E.17.

Royal Veterinary College, London

A new governing body of this college has been set up in accordance with the royal charter granted last year. The Duke of Gloucester is the president of the court of governors, and there are six vice-presidents including Sir John McFadyean. Among the bodies nominating members of the court and of the executive council are the County Councils Association, the Medical Research Council, the Corporation of London, the Privy Council, the Ministry of Health, the Colonial Office, the University of London, and the Royal Society. Under the charter the name is changed to the Royal Veterinary College and Hospital.

West London Hospital

Queen Mary has consented to visit this hospital on Oct. 18th to open the new extension.

Nurses' Home at Walton Hospital

The Lady Mayoress of Liverpool on Feb. 25th opened the new extension to the nurses' home at this hospital. It has cost £43,290 and provides accommodation for 166 nurses.

Dewsbury Infirmary

A Coronation appeal for £50,000 is being issued on behalf of this hospital. It is to be on a seven years' plan, any promise made by a donor being divided into 14 half-yearly payments. The money raised is to be utilised to pay off the debt on the new infirmary and to provide for the extension of the nurses' home and other necessary enlargements.

Kidderminster Hospital

Carpet and other firms have offered to pay the accumulated debt of this hospital, which amounts to £9168, provided that schemes of extensions are abandoned until income and expenditure balance, and "that no member of the medical profession or the hospital staff (medical or otherwise) be allowed to act in any executive capacity at the hospital, or to serve as an ordinary member of any committee, the function of the staff to be purely advisory without any power to vote on questions of finance or policy."

Glasgow Royal Maternity Hospital

Mr. Archibald Walker has given £25,000 to this hospital.

Kettering General Hospital

Mr. Alan Timpson has announced that he intends to double his gift of £5000 to this hospital.

Royal National Hospital for Rheumatic Diseases, Bath

The Duchess of Kent has agreed to become president of this hospital.

New Convalescent Home at Mitcham

On March 1st Sir Kingsley Wood laid the foundation-stone of a new convalescent home at Mitcham. It is the gift of Mr. I. H. Wilson, the donor of Wilson Hospital, and there will be fifty beds.

Appointments

BEYNON, JOHN, M.B. Lond., has been appointed Hon. Medical Registrar to the Royal Sussex County Hospital, Brighton.

BRADBEER, W. H., M.S. Lond., D.L.O., Hon. Aurist and Laryngologist to Torbay Hospital, Torquay.

DAVISON, M. H. A., M.D. Durh., "Morning List" Anæsthetist for the Royal Victoria Infirmary, Newcastle-upon-Tyne.

GIFFORD, E. H. W., M.B.N.Z., Resident Medical Officer at the Royal Cancer Hospital (Free) London.

HUGHES, JOHN, B.Chir. Camb., F.R.C.S. Eng., Clinical Assistant to the Surgical Department of the Sheffield Royal Infirmary.

LOVIBOND, J. L., M.B. Camb., M.R.C.P. Lond., Junior Medical Registrar at the Middlesex Hospital.

MACRAY, J. S. B., M.B. Aberd., D.P.H., Deputy Medical Officer of Health for Bury.

MILLER, F. J. W., M.B. Durh., D.C.H., Medical Registrar at the Royal Victoria Infirmary, Newcastle-upon-Tyne.

MORRIS, W. I. C., M.B., F.R.C.S. Edin., M.C.O.G., Full-time Obstetric Consultant for the County of Ayr.

NORTHFIELD, D. W. C., M.S. Lond., F.R.C.S. Eng., Assistant Surgeon to the Neurosurgical Department of the London Hospital.

PAGE, B. H., M.B. Camb., F.R.C.S. Eng., Surgical First Assistant and Registrar at the London Hospital.

ROBERTS, G. J., M.D. Edin., D.P.H., Deputy Medical Officer of Health and Deputy School Medical Officer for Bootle.

SEED, G. S., M.B. Leeds, F.R.C.S. Eng., D.L.O., Hon. Aural Surgeon to the Leeds General Infirmary.

WILKIE, J. L., M.B., F.R.C.S. Edin., Assistant County Medical Officer for Northumberland.

St. John Clinic, London.—The following appointments are announced:—

TANNER, W. E., M.S. Lond., F.R.C.S. Eng., Consulting Surgeon;

NOBLE, T. P., M.D. Edin., F.R.C.S. Eng., F.R.S. Edin., Clinical Assistant to Orthopædic Surgeon; and

TIPPETT, G. O., M.B. Lond., F.R.C.S. Eng., Clinical Assistant to Orthopædic Surgeon.

Queen Charlotte's Maternity Hospital, London.—The following appointments are announced:—

BEATON, DONALD, M.B. Edin., Senior Resident Medical Officer;

MEEK, EDWARD, M.D. Toronto, L.M. Dubl., Assistant Resident Medical Officer;

GRACE, LUCY W., M.B. Lond., Resident Anæsthetist and District Resident Medical Officer;

GIBB, ANN F., M.B. Edin., Resident Anæsthetist; and

WOODHEAD, ALICE L., M.D. Manitoba, Resident Medical Officer at the Isolation Block, Hammersmith.

Births, Marriages, and Deaths

BIRTHS

ANDERSON.—On March 2nd, to Dr. and Mrs. Anderson, Grove Hospital, Tooting Graveney, S.W.17—a son.

GILLETT.—On March 3rd, at Eastbourne, the wife of Dr. F. H. Gillett, of a son.

GRIFFITHS.—On March 8th, 1937, at Gwynant, Buxton, to Nancy (née Wrigley), wife of Dr. G. J. Griffiths—a daughter (Elizabeth Ann Bryceson).

JARMAN.—On March 3rd, at New Cavendish-street, W., the wife of Dr. Ronald Jarman, of a son.

POWELL-EVANS.—On March 3rd, the wife of Dr. John Powell-Evans, Kingston-road, Wimbledon, of a daughter.

TAYLOR.—On Feb. 26th, the wife of Dr. Antony Taylor, Banwell, Som., of a daughter.

DEATHS

ATTLEE.—On March 8th, at Wellingborough, John Attlee, M.D. Camb., late of Grosvenor-street, W., aged 67.

HAM.—On March 7th, Charles Edward Ham, M.D. Lond., late of Clapham, and Devonshire-place, W.

MOSSOP.—On March 4th, Arthur George Mossop, M.R.C.S. Eng., J.P., formerly M.O.H., Pretoria, of Bournemouth, in his seventy-fifth year.

RIDDELL.—On March 6th, at Torquay, Robert George Riddell, M.D., F.R.C.S. Edin.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, March 16th.
General Meeting of Fellows. 5.30 P.M. Ballot for election to the fellowship.
Pathology. 8.30 P.M. Annual general meeting. Joan Taylor: Investigation of Two Cases of Agranulocytosis. G. A. H. Buttle, H. J. Parish, H. Proom, and Dora Stephenson: *p*-Aminobenzenesulphonamide and its Derivatives: (*a*) Treatment of Experimental Infections of Mice; (*b*) Bactericidal Effects Induced in Blood. C. H. Andrewes, Wilson Smith, and C. H. Stuart Harris: Recovery of Virus from Cases of Influenza in the 1917 Epidemic. C. H. Gray: Ketosis in Infants. Joan M. Ross and Joan C. Drury: 1. Sections from a Case of Sickle-cell Anæmia. 2. A New Method of Staining Red Blood Corpuscles in Tissues. Dorothy S. Russell and D. W. C. Northfield: 3. Calcified Papilloma of Choroid Plexus.
THURSDAY.
Dermatology. 5 P.M. (Cases at 4 P.M.) Dr. H. W. Barber: 1. Changes in the Pilosebaceous Follicles and Sebaceous Secretion following Herpes Zoster. Dr. R. Klaber: 2. Necrobiosis Lipoidica Diabeticorum (Arrested Case). 3. Sebo-cystomatosis (Gunther). 4. Lichen Sclerosus (Hallopeau). Dr. L. Forman: 5. Pustular Bactericide. Dr. Elizabeth Hunt: 6–7. Recurrent Buccal Ulceration.
Neurology. 8.30 P.M. Dr. J. K. Hasler, Prof. A. D. Macdonald, Dr. Macdonald Critchley, Dr. F. R. Ferguson, and Dr. W. Russell Brain: The Neurological Sequelæ of Spinal Anæsthesia.
FRIDAY.
Physical Medicine: Obstetrics and Gynæcology. 5 P.M. Dr. M. Keyes, Dr. Leonard Boyes, Prof. D. Dougal, and Mr. J. D. Barris: Physical Treatment of Pelvic Disorders (excluding Electrotherapy).
Odontology. Visit of the Odontological Section of the Birmingham Medical Institute. 7 P.M., Dinner at Langham Hotel, W. 8.30 P.M., Prof. H. F. Humphreys: Three Cases of Osteomyelitis of the Jaw. Dr. E. W. Fish: The Significance of Oral Infection, its Accessibility and Treatment. Dr. J. Wallace Graham: The Toxicity of Sterile Filtrate from Parodontal Pockets.
SATURDAY.
Odontology (cont.). 10.15 A.M., Cases will be shown by Mr. John Bunyan, Mr. J. Edgley Curnock, Mr. Herbert Gordon, Mr. G. T. Hankey, Mr. C. Bowdler Henry, Mr. W. E. Herbert, Dr. Werner Lewinsky, and others.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.
THURSDAY, March 18th.—8.15 P.M., Laboratory Meeting at the Royal Army Medical College, Grosvenor-rd., S.W.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thornhaugh-street, W.C.
FRIDAY, March 19th.—5 P.M., Dr. Henry Herd: Physical Education.

MEDICO-LEGAL SOCIETY.
THURSDAY, March 18th.—8.30 P.M. (Manson House, Portland-place, W.), Dame Louise McIlroy: Phobias and Obsessions.

HUNTERIAN SOCIETY.
MONDAY, March 15th.—8.30 P.M. (Simpson's Restaurant, Bird-in-Hand Court, 76, Cheapside), Dr. A. G. Maitland-Jones and Dr. L. Mandel: Gastro-enteritis in Children.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-st., W.
THURSDAY, March 18th.—8 P.M., Prof. S. Russ and Miss G. M. Scott: Some Biological Effects of Continuous Gamma Irradiation, with Note on Protection.
Medical Section.
FRIDAY.—11 A.M., Visit to the X Ray Department of the London Hospital. 5 P.M., Case Demonstration and Discussion.

EUGENICS SOCIETY.
TUESDAY, March 16th.—5.15 P.M. (Linnean Society, Burlington House, Piccadilly, W.), Miss H. Holland, Mr. J. R. Baker, Ph.D., Dr. S. Zuckerman: Birth Control—the Last Year's Work.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY, Royal Northern Hospital, Holloway-road, N.
WEDNESDAY, March 17th.—9.15 P.M., Judge Earengey, K.C.: The Doctor in the Witness-box.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLÆGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 16th, and THURSDAY.—5 P.M., Dr. H. Gardiner-Hill: Growth and Development, their Pathological Aspects. (Oliver-Sharpey lectures.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, March 15th.—5 P.M., Dr. C. Keith Simpson: The Pathology of the Adrenal Gland in Relation to Sudden Death.
FRIDAY.—5 P.M., Dr. A. J. E. Cave: Anatomy of the Trigeminal Nerve.

UNIVERSITY OF LONDON.
WEDNESDAY, March 17th.—5.30 P.M. (Galton Laboratory, Gower-street, W.C.), Dr. V. Friedenreich: Blood Groups and Genetics.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
WEDNESDAY, March 17th.—Noon, clinical and pathological conference (medical). 2 P.M., Dr. Janet Vaughan: The Blood Picture in Bone Diseases. 3.15 P.M., clinical and pathological conference (surgical). 4.30 P.M., Miss Honor Fell, D.Sc.: Tissue Culture.
THURSDAY.—Noon, clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Dr. Duncan White: Radiological Demonstration. 3.30 P.M., Mr. A. K. Henry: Demonstrations on the Cadaver of Surgical Exposures. 3.30 P.M., Dr. P. M. F. Bishop: Hormone Therapy in Gynæcology.
FRIDAY.—2 P.M., operative obstetrics. 2.30 P.M., Prof. Hey Groves: Fractures. 3 P.M., department of gynæcology, pathological demonstration.
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, March 15th.—10 A.M., Dr. Post: Demonstration of X Ray Films. Skin clinic. 11 A.M., surgical wards. 2 P.M., operations, surgical and gynæcological wards, medical, surgical, and gynæcological clinics.
TUESDAY.—10 A.M., medical wards. 11 A.M., surgical wards. 2 P.M., operations, medical, surgical, and throat clinics. 4.15 P.M., Dr. Konstam: Hypertension.
WEDNESDAY.—10 A.M., children's ward and clinic. 11 A.M., medical wards. 2 P.M., gynæcological operations, medical, surgical, and eye clinics. 4.15 P.M., Dr. Redvers Ironside: Neoplasms of the Posterior Intracranial Fossa.
THURSDAY.—10 A.M., neurological and gynæcological clinics. Noon, fracture clinic. 2 P.M., operations, medical, surgical, and genito-urinary and eye clinics.
FRIDAY.—10 A.M., medical wards, skin clinic. Noon, lecture on treatment. 2 P.M., operations, medical, surgical, and throat clinics. 4.15 P.M., Mr. Vlasto: Mastoid Infection.
SATURDAY.—10 A.M., children's and surgical clinic. 11 A.M., medical wards.
The lectures at 4.15 P.M. are open to all medical practitioners without fee.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, March 15th, to SATURDAY, March 20th.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, W., all-day course in orthopædics.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W., afternoon, M.R.C.P. course in neurology.—ROYAL CHEST HOSPITAL, City-road, E.C., Mon., Wed., and Fri., 8 P.M., M.R.C.P. course in chest diseases (open to non-members).—BROMPTON HOSPITAL, S.W., twice weekly at 5 P.M., M.R.C.P. course in chest diseases.—ALL SAINTS' HOSPITAL, Austral-street, S.E., Sat. and Sun., course in urology.—Unless otherwise stated, courses arranged by the fellowship are open only to members.

HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.
THURSDAY, March 18th.—2 P.M., Mr. Eric Lloyd: Technique in Operations on the Knee-joint. 3 P.M., Dr. Alan Moncrieff: Some Special Diets.
Out-patient clinics daily at 10 A.M., and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, March 15th.—3.30 P.M., Dr. Kinnier Wilson: Congenital and Heredo-familial Diseases (IV).
TUESDAY.—3.30 P.M., Dr. Grainger Stewart: Epilepsy.
WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY.—3.30 P.M., Mr. Cawthorne: Intracranial Complications of Disease of the Cranial Air Sinuses.
FRIDAY.—3.30 P.M., Dr. Purdon Martin: Toxic Diseases of the Brain and Spinal Cord.
Out-patient clinic daily at 2 P.M.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY, March 16th.—5.30 P.M., Dr. D. Evan Bedford: Left Ventricular Failure.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, March 19th.—4 P.M., Mr. W. G. Scott-Brown: Deaf Mutism.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.
WEDNESDAY, March 17th.—4 P.M., Mr. D. H. Patey: The Present Position of Surgery of the Thyroid Gland.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.
FRIDAY, March 19th.—4.30 P.M., Mr. A. G. Timbrell Fisher: Orthopædic and Surgical Treatment in Rheumatic Diseases.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY, March 17th.—4 P.M. (St. James' Hospital, Ouseley-road, S.W.), Dr. H. Haldin-Davis: Common Skin Ailments.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, March 16th.—4.15 P.M., Dr. J. Wharton: Demonstration of Ophthalmic Cases.
FRIDAY.—4.15 P.M., Mr. A. Graham Bryce: Demonstration of Surgical Cases.

ANCOATS HOSPITAL, Manchester.
THURSDAY, March 18th.—4.15 P.M., Dr. Arnold Renshaw: Twenty-five Years' Work as a Pathologist.

LEEDS GENERAL INFIRMARY.
TUESDAY, March 16th.—3.30 P.M., Mr. John Foster: The Diagnostic and Prognostic Significance of Retinal Changes in Renal and Vascular Disease.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, March 17th.—4.15 P.M. (Western Infirmary), Prof. A. J. Ballantyne: The Treatment of Cataract and the Cataract Patient.

NOTES, COMMENTS, AND ABSTRACTS

INFLUENCE OF SCHOOL ROUTINE ON THE GROWTH AND HEALTH OF CHILDREN

BY JOHN ALLAN

THE possibility that school routine may be a factor of importance in the development of children seems to have been strangely neglected. In the past studies of growth have taken little account of periodic changes in the environment of the child and have been concerned mainly with standards of height and weight rather than with growth. Investigations carried out during the last fourteen years show that significant changes of growth rate occur during each school term. It is difficult to resist the conclusion that the school environment is directly responsible for these changes.

MATERIAL

The bulk of the material on which this study is based was collected in a boarding school in the south of England between 1923 and 1932. Unfortunately the numbers of boys in the school were small, ranging from 60 to a little over 90, so that averages for any one term were derived from somewhat limited figures. The total figures for the whole eight-year period reach quite large numbers and the consistency of behaviour in each term was very striking. This in conjunction with evidence from a number of other schools, makes one confident of the validity of the results presented here. As to conditions in the school it should be stated that diet was ample and satisfactory in quality and content; hours of work, exercise, and rest were carefully adjusted to the estimated needs of growing children; and there was opportunity for an unusually wide range of activities and interests out of school hours. The ages of the children ranged from 11 to 19 years.

METHOD

Each boy was weighed, measured, and examined at the beginning and end of term, and measurements of height and weight only were taken at intervals of four weeks. All measurements were taken without clothing and at the same time of day on each occasion, a steelyard type of weighing-machine was used. In this way a series of measurements was obtained giving precise information about growth changes in each third of the term.

WEIGHT AND HEIGHT CHANGES

For the final analysis each increment was expressed as a percentage of the previous measurement before averaging. It was at once obvious that more weight was gained in the first month of term than in the second, and more in the second than in the third. Although many would lose some weight during the final month, a few even losing more than they had gained in the previous two months, in general 70–80 would show a gain in weight for the term as a whole. When the increments for each month of the whole period were totalled, averaged, and plotted, as in Fig. 1, a picture was obtained which showed the trend of fluctuations observable in each year, and among children in all age-groups.

It is noticeable that at this school the rate of increase in weight during the holidays is much

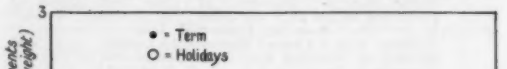

FIG. 1.—The average monthly increments in weight in a school of boys aged 11–19 years. The numbers measured varied from 478 in August and September to 650 in December.

below that for the early portions of the spring and autumn terms. As the rate of energy expenditure during the term must have been very much higher than that for the holidays, it is probable that the gain during the term represents a gain of bone and muscle. A number of considerations lead to the tentative conclusion that at this school the retardation during the final months might be due to the monotony inseparable from institutional life rather than to actual pressure of work and play. Comparison made with sample figures from other schools make it probable, nevertheless, that in many schools pressure of work plays an important part in its causation.

Figures for height increments show a similar trend during the terms but over a much smaller range. In this case a slightly higher rate of increase is found during the holidays than in any month of any term, the spring holidays showing the highest increase of all. In general the extra growth recorded for the holiday periods may be largely attributable to a reduction of the mechanical pressures imposed on the compressible intervertebral discs by such activities as gymnastics, games, and athletics.

In both height and weight there are periods of reduced growth rate occurring towards the end of each term of the school year. The regularity of the form of the fluctuations would lead one to suppose that seasonal and climatic factors have no great influence where schools in the south of England are concerned.

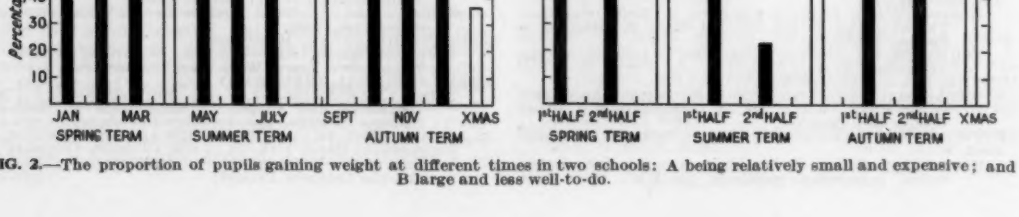

FIG. 2.—The proportion of pupils gaining weight at different times in two schools: A being relatively small and expensive; and B large and less well-to-do.

COMPARISON OF SCHOOLS

An interesting comparison of the records of two schools is presented in Fig. 2.* This shows the proportion of boys at each of two schools who gained weight in term and holiday time during 1926. School A was relatively small, while school B was very large and had a rigorous and rather formal routine with greater pressure of work and play and less time allotted to rest and sleep. Diets at both schools were satisfactory and the range of ages was virtually identical. Both schools were situated in pleasant country in the South of England. During the slightly longer intervals between weighings at B rather fewer children gained weight, but the trend downwards at the end of term was similar for both. During the holidays the contrast is great, a very high proportion of boys from B gaining weight on each occasion, making it appear that some compensatory acceleration was taking place. It is significant to note that the children attending B come, in the main, from less well-to-do homes than those attending A where the fees are very much higher.

This peculiar difference in holiday behaviour, noticeable in other years as well, may form the basis for a rough assessment of the relative severity of routine in different schools of a similar type. A comparison of the percentages of children who gain weight during the term and holiday times will give an indication of the position. The higher the percentage who gain during the holidays the more strenuous and exacting the régime. The converse must not be considered to have any significance if the children come from poor homes.

INCIDENCE OF ILLNESS

Studies of the incidence of illness at school A show a pronounced tendency for the bulk of sickness and disability to occur in one or other of two well-defined periods of the term. One of these periods when a high incidence of illness may be expected is at about the third week of term, while the other occurs about the eighth or ninth week. It seems to be rare for an epidemic to occur or reach its peak during the middle four weeks of term.

"SUBNORMAL" NUTRITION

Material obtained from these figures relating to children from prosperous homes provides a good basis for comparison of standards of nutrition and growth. It is remarkable to find that in an area of south-east London there are comparatively few children who show any serious signs of defective nutrition. In the main they appeared to be sturdy, robust, and active, but on comparing their height for age with the standard achieved by children in prosperous boarding schools it was found that many were a full two years behind. Hereditary factors may have played some part, but it would be surprising if they were sufficient to account for the 70 per cent. who were an inch or more below the average for their age on the standard of the well nourished. Moreover, the children concerned were not drawn from a slum area and the parents of the majority were in employment. It seems probable therefore that stunted height resulting from defective nutrition will tend to mask the real state of affairs throughout the country. The danger that much malnutrition will be passed over is particularly great in view of the recent change of policy of the Board of Education Medical Authorities which is outlined in the latest annual report of the chief medical officer (The Health of the School Child. Report for 1935. H.M.S.O. 2*s.* 6*d.*). From this it appears that estimates of nutritional states are now being based on clinical observations only, standards of height and weight for age being no longer applied. In this way only the grossly undernourished will be recorded and the general nutrition of the child population will be made to appear much better than is actually the case.

CONCLUSIONS

It should not be assumed that the present organisation of school routine is satisfactory in relation to the growth and health of children. There is evidence to show that the effects may even be detrimental to development.

It seems desirable that a close study should be made of the influence on growth and health of schools of different types. Much remains to be learnt concerning the effects of school routine on growth and health. With our present knowledge it is unsafe to assume that any of our schools are providing the best possible environment for development.

*I am indebted to Dr. G. E. Friend of the Medical Officers of Schools Association for permission to make use of his records published in "The Schoolboy, His Nutrition and Development."

SCIENCE AND BUILDING

BY the enterprise of the directors of the Building Centre in New Bond-street the Department of Scientific and Industrial Research has been enabled to stage a very interesting exhibition at this centre. And this is of importance because, as the guide suggests, "it is probably true to say that it has been left untouched to a greater extent than any other major industrial activity by the developments in science and technology of the last hundred years."

The exhibits from the Building Research Station include a section devoted to concrete, showing by graphs and descriptive matter how much the strength of concrete depends on its water content and the absence of air voids. Samples are shown of the light-weight aggregates which are used increasingly for concrete partition walls and casing for steelwork. Plastering materials are apt to dry too slowly or too rapidly, but the rate of drying can be controlled. Deterioration of paint over plaster may be due to mere blistering and peeling owing to imprisoned water, or to chemical action of alkaline materials on such paints as Prussian Blue.

The Fuel Research Station illustrates the properties of various fuels, the radiant efficiency of open fires, and the measurement of smoke emission from domestic fires.

Among the exhibits from the Forest Products Research Laboratory is one showing the resistance of different timbers to erosion. Rhodesian teak and Canadian maple wear more smoothly as flooring than oak, birch, jarrah, or coniferous woods.

The National Physical Laboratory has exhibits of illumination, and models of rooms with and without noise-reducing devices; noise producers and telephones allow the visitor to make practical comparisons for himself. Studies of wind pressure on buildings, vibration of roads and buildings, and movement of the masonry of the Tower of London are illustrated and explained.

Water softening by base-exchange materials, including some British clays and synthetic resins, contamination of water by lead and filters for removal of that metal, and other such matters are set out in a joint exhibit of the Water Pollution Research Board and the Chemical Research Laboratory.

This exhibition should be of value to all who may have to advise on the building of hospitals or other institutions, and should help them to avoid mistakes which are sometimes made when materials are chosen for their artistic effect when new rather than for their permanent value in practical use.

The exhibition closes on March 25th.

DURATION OF LIFE IN FOSSIL MAN

AN attempt to determine how long men lived in the remote ages has recently been made by H. V. Vallois, a French anthropologist (*C.R. Acad. Sci., Paris*, Jan. 4th, 1937, p. 60). The varied phases of eruption of the teeth and ossification of the limb bones may suffice to indicate the age of infants and adolescents, but the problem proves much more difficult when adult bones are examined. Vallois states that attrition of the teeth is an unreliable

guide, since this occurred much earlier in prehistoric times than in living man, but more accurate work on synostosis of the cranial sutures enabled him to employ this sign as a basis in his investigation. The remains of 173 men, women, and children of the palæolithic and mesolithic ages were studied, some by Vallois himself, and the data relating to the rest being deduced from descriptions published by other workers. Piltdown man, pithecanthropus, and sinanthropus were not included in the survey.

It was found that 45 of these prehistoric people died during the first decade and 17 in the second. Thereafter Vallois separates the sexes and finds that in the third decade the females have a higher survival-rate, the figures being 27 against 17. The position is then reversed in favour of the males aged thirty to forty, when the figures are 12 against 7, and this superiority is conspicuous in the fifth decennium, only 1 woman surviving to 10 men. Only 3 lived to be over fifty, and none showed the complete synostosis commonly seen in adults after seventy or eighty years of age. It may be objected that the fragile skulls of old people would not be preserved, but it is pointed out that many even more delicate skulls of children have been discovered. With regard to synostosis of the cranial sutures Vallois is of opinion that in fossil man the tendency would have been to an earlier fusion, since in primitive races it occurs a little earlier than in the civilised, while in anthropoids the cranium is completely ossified at an age equivalent to twenty-five years in man.

The figures cited seem to indicate that fossil man was short-lived, only 10 of 39 men and 1 of 35 women reaching the fourth decade. In these early ages man appears to have been subject to the law which governs savage mammifers, that death coincides with the decline of physical strength and sexual activity.

In our issue of Feb. 27th (p. 517) we gave the price of the revised edition of Prof. Curtis Hilliard's Textbook of Bacteriology and its Applications (London: Ginn and Co.) as 12*s.* 6*d.* Copies of the earlier edition of the book can still be supplied at this price, but the publishers inform us that the price of the new edition will be 15*s.*

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hosp.—H.S., £150.
Albert Dock Hosp., Connaught-road, E.—Res. M.O., at rate of £110.
Aylesbury, Royal Buckinghamshire Hosp.—Second Res. M.O., at rate of £150.
Barbados General Hosp.—Two Jun. H.S.'s, each £325.
Barnsley, Beckett Hosp. and Dispensary.—Jun. H.S., £200.
Barnstaple, North Devon Infirmary.—Res. M.O., at rate of £150.
Barrow-in-Furness County Borough.—Asst. M.O.H. and Asst. School M.O., £500.
Basingstoke, Park Prewett Mental Hosp.—Second Asst. M.O., £600. Also Jun. Asst. M.O., £350.
Bath, Royal United Hosp.—H.S. to Ear, Nose, and Throat Dept., at rate of £150.
Beckenham, Bethlem Hosp., Monks Orchard.—Two Res. H.P.'s, each at rate of £150.
Birmingham, Monyhull Colony.—Res. Asst. M.O., £350.
Bolton Royal Infirmary.—Asst. Res. Surg. O., £200.
Bootle County Borough.—Asst. M.O.H. and Asst. School M.O., £500.
Boston General Hosp.—Res. M.O., at rate of £150.
Bradford, Municipal General Hosp., St. Luke's.—H.P.'s and H.S.'s, each at rate of £150.
Bradford Royal Eye and Ear Hosp.—H.S., £180.
Bradford Royal Infirmary.—Two H.P.'s, three H.S.'s, and Cas. H.S., each at rate of £150.
British Postgraduate Medical School, Ducane-road, W.—Res. Anæsthetist, at rate of £150.
Burnley, Victoria Hosp.—H.P. and H.S., each at rate of £150.
Burton-on-Trent General Infirmary.—H.S., £150.
Canterbury, Kent and Canterbury Hosp.—H.S., at rate of £125.
Cardiff Royal Infirmary.—H.S. to Ear, Nose, and Throat Dept., at rate of £100. Also Ophth. H.S., at rate of £40.
Central London Throat, Nose, and Ear Hosp., Gray's Inn-road, W.C.—Hon. First Asst.
Cheltenham General and Eye Hosps.—H.S., £150.
City of London Hosp. for Diseases of the Heart and Lungs, Victoria Park, E.—H.P., at rate of £100.
Colonial Medical Service.—Thirty Vacancies, £600–£700, rising to between £1000 and £1200.*
Derbyshire Education Committee.—Asst. School M.O., £500.
Doncaster Royal Infirmary and Dispensary.—Res. Anæsthetist, at rate of £175.
Dover, Royal Victoria Hosp.—Res. M.O., £180.
Dreadnought Hosp., Greenwich, S.E.—H.P. and H.S., each at rate of £110.
Durham, Richard Murray Hosp., Blackhill.—H.S., £200.
Evelina Hosp. for Sick Children, Southwark, S.E.—H.S., at rate of £120. Also Ophth. Surgeon, 50 guineas.
Exeter, Royal Devon and Exeter Hosp.—H.S. to Ear, Nose, and Throat Dept., at rate of £150.
Gloucestershire Royal Infirmary.—H.S., at rate of £150.
Halifax General Hosp.—Med. Supt., £800.
Halifax Royal Infirmary.—Second H.S., at rate of £175.
Harefield County Sanatorium.—Physician, £1000.
Harrogate, Royal Bath Hosp.—Res. M.O., £156.
Hosp. for Sick Children, Great Ormond-street, W.C.—Res. H.P. and Res. H.S., each at rate of £100.
Hosp. of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S., at rate of £75.*
Hull City Hosp.—Jun. Res. M.O., £350.
Hull Royal Infirmary.—H.S. to Ophth. and Ear, Nose, and Throat Dept., at rate of £150.
Indian Medical Service.—Commissions.
Infants Hosp., Vincent-square, Westminster, S.W.—H.P., at rate of £100.
Ipswich County Borough.—M.O.H., £1000.
Lancaster County Mental Hosp.—Asst. M.O., £500.
Lancaster Royal Infirmary.—Two Jun. H.S.'s, each at rate of £130.
Leicester Royal Infirmary.—Res. Radiologist, at rate of £200.
Leicestershire County Council.—Asst. County M.O.H., £700.
Liverpool Sanatorium, Delamere Forest, Frodsham.—Sen. Asst. to Med. Supt., £325.
London County Council.—Two Res. Med. Supts., £1300 and £1100. Also Asst. M.O.'s (Grade I), £350.
London Homœopathic Hosp., Great Ormond-street, W.C.—H.P., at rate of £200.
Lowestoft Borough and Port Sanitary District.—M.O H. and School M.O., £900.
Manchester, Ancoats Hosp.—Res. M.O., at rate of £150. Also H.S., at rate of £100.
Manchester, Booth Hall Hosp. for Children.—Deputy Med. Supt., £550.
Manchester City.—Asst. Tuber. O., £650.
Manchester Royal Eye Hosp.—Jun. H.S., £120.
Manchester, Withington Hosp.—Res. Asst. M.O., at rate of £200.
Mansfield, Harlow Wood Orthopædic Hosp.—H.S., at rate of £200.
Margate and District General Hosp.—Res. M.O., £150.
Middlesbrough, North Riding Infirmary.—Cas. O., at rate of £150.
Newark General Hosp.—Res. H.S., £175.
Newcastle General Hosp.—H.S., at rate of £150.
Newcastle-upon-Tyne City Hosp. for Infectious Diseases.—Res. Med. Asst., £350.
Newport, Mon, Royal Gwent Hosp.—H.P., at rate of £150. Also Cas. O. and H.S., each at rate of £135.
Norwich, Norfolk and Norwich Hosp.—H.S. to Spec. Depts., £120–£160.
Nottingham and Midland Eye Infirmary.—Res. H.S., at rate of £200.
Nottingham City.—Res. Med. Supt. for City Hospital and M.O. for City Institution, £1000. Also Asst. M.O.'s for Maternity and Child Welfare Work and V.D. Clinic, each £500.
Oxford University.—Asst. Director of Pathology, £1000.
Preston and County of Lancaster Royal Infirmary.—Cas. H.S., £150.
Princess Louise Kensington Hosp. for Children, St. Quintin-avenue, W.—Hon. Radiologist. H.P., at rate of £120–£150. Also Part-time Registrar, £100.
Putney Hosp., Lower Common, S.W.—Res. Surg. O., £150.
Reading, Royal Berkshire Hosp.—H.S., Cas. O., and H.S. to Spec. Depts., each at rate of £125.
Richmond, Surrey, Royal Hosp.—Jun. H.S., at rate of £100.
Royal Society of Medicine, 1, Wimpole-street, W.—Nichols Fellowship, £150, &c.
Samaritan Free Hosp. for Women, Marylebone-road, N.W.—H.S., at rate of £100.
Seamen's Hosp. Society, Greenwich, S.E.—Hon. Asst. Physician.
Sheffield Children's Hosp.—H.P., at rate of £100.
Southend-on-Sea General Hosp.—H.P. and H.S., each at rate of £100.
Stockport, Stepping Hill Hosp.—Res. Asst M.O., at rate of £200.
Stoke-on-Trent, Burslem, Haywood, and Tunstall War Memorial Hosp.—Res. H.P., at rate of £150.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S., at rate of £150.
Sunderland Royal Infirmary.—Cas. O., £150.
Surrey County Council.—Asst. M.O., £600.
Swanley, Kent, Hosp. Convalescent Homes, Parkwood.—Res. M.O., at rate of £200.
Swansea General and Eye Hosp.—H.P., at rate of £150.
University College Hosp., Gower-street, W.C.—Hon. Asst. Surgeon in Ear, Nose, and Throat Dept.
University of London.—S. A. Courtauld Chair of Anatomy, £1000.
Westminster Hosp., Broad Sanctuary, S.W.—Asst. Med. Reg., at rate of £100.
Willesden General Hosp., Harlesden-road, N.W.—Cas. O., at rate of £100.
Wilts County Council.—Asst. M.O., £700.
Wimbledon Hosp., Thurstan-road, S.W.—Res. M.O., at rate of £150.
Wolverhampton Royal Hosp.—H.S. for Orthopædic and Fracture Dept., at rate of £100.
York Dispensary.—Res. M.O., £175.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Malvern (Worcester) and Blyth (Northumberland).

* In our last issue (p. 59) this was incorrectly given as £1000–£1120.